FRITZ J. FRANK
President

J. H. VAN DEVENTER
Editor

C. E. WRIGHT
Managing Editor

J. A. ROWAN
News Editor

A. I. FINDLEY
Editor Emeritus

R. E. MILLER
Machinery Editor

F. J. WINTERS
Art Editor

T. W. LIPPERT
Metallurgical Editor

Associate Editors

F. J. OLIVER

W. A. PHAIR

G. RICCIARDI

Washington Editor
L. W. MOFFETT

Resident District Editors

T. C. CAMPBELL
Pittsburgh

ROBERT C. BINGHAM
Chicago

D. R. JAMES
Cleveland

W. F. SHERMAN
Detroit

Editorial Correspondents

F. B. RICE-OXLEY
London, England

ROBERT G. McINTOSH
Cincinnati

G. FRAZAR
Boston

P. FIDRMUC
Hamburg, Germany

C. F. MEYER
Milwaukee

CHARLES POST
San Francisco

F. SANDERSON
Toronto, Ontario

ASA ROUNTREE, JR.
Birmingham

LEROY W. ALLISON
Newark, N. J.

ROY M. EDMONDS
St. Louis

F. T. TURNER, JR.
Buffalo

★

Owned and Published by

CHILTON COMPANY
(Incorporated)

Publication Office
Chestnut and 56th Sts.,
Philadelphia, Pa.

Editorial and Executive Offices
239 West 39th St.
New York, N. Y.

OFFICERS AND DIRECTORS

C. A. MUSSELMAN, *President*
FRITZ J. FRANK, Executive Vice-President
FREDERIC C. STEVENS, Vice-President
JOSEPH S. HILDRETH, Vice-President
GEORGE H. GRIFFITHS, Vice-President
EVERIT B. TERHUNE, Vice-President
WILLIAM A. BARBER, Treasurer
JOHN BLAIR MOFFETT, Secretary
JOHN H. VAN DEVENTER, JULIAN CHASE,
THOMAS L. KANE, CHARLES S. BAUR,
G. CARROLL BUZBY, P. M. FAHRENDORF

★

C. S. BAUR, *General Advertising Manager*
A. H. DIX, *Manager Reader Service*

Member, Audit Bureau of Circulations
Member Associated Business Papers
Indexed in the Industrial Arts Index.
Published every Thursday. Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 a year. Single copy, 25 cents. Cable Address, "Ironage, N. Y."

ADVERTISING STAFF

Emerson Findley, 621 Union Bldg., Cleveland
B. L. Herman, Chilton Bldg., Phila.
H. K. Hottenstein, 1012 Otis Bldg., Chicago
H. E. Leonard, 239 W. 39th St., New York
Peirce Lewis, 7310 Woodward Ave., Detroit
C. H. Ober, 239 W. 39th St., New York
W. B. Robinson, W. J. Fitzgerald } 428 Park Bldg., Pitts.
D. C. Warren, P. O. Box 81, Hartford, Conn.
Don F. Harner, 1595 Pacific Avenue, Long Beach, Cal.

THE IRON AGE

Contents

SEPTEMBER 7, 1939

Twenty One Cents on the Dollar 25
Steel Standardization 27
Choosing a Metal Finish 34
Copper Wire Annealed in Strands 39
Throw Away the Scrap Barrel 40
California Builds Steel Homes 46
Job Rating 48
Offerings in Motors and Lighting Equipment 51
On the Assembly Line 56
Washington News 60
THE NEWS IN BRIEF 74
Statistics on Metal-Working Activity 80
Weekly Ingot Operating Rates 81
Rate of Activity in Capital Goods 81
Plant Expansion and Equipment Buying 98

▼ ▼ ▼

Just Between Us Two 116
Products Advertised 119
Index to Advertisers 148

Copyright 1939 by Chilton Company (Inc.)

You'll agree this is Headline News

D-B-L HIGH SPEED STEEL

★PERFORMS WITH 18-4-1

D-B-L is the latest sensation of the tool steel world! Here at last is the culmination of years of research—a *brand-new* steel alloyed with native elements, not subject to foreign embargoes—that will cut right along with 18-4-1 on *your own work*.

Tests country-wide prove that D-B-L has *all* the properties of a standout high speed steel . . . high impact resistance, wide hardening and tempering range, and high secondary hardness. It machines easily, forges readily and grinds the same as 18-4-1.

★COSTS LESS

D-B-L is the *first* commercially successful high speed steel that completely meets your demand for a product to match 18-4-1, *at less cost!* D-B-L saves money—improves your competitive position.

★HEAT-TREATS AS SIMPLY

D-B-L can be heat-treated in the same furnaces and under the same atmosphere as 18-4-1. It shows no more decarburization than 18-4-1; no borax or other coating is required. In other words, the use of D-B-L requires *no special precautions*, nor will your men have to experiment with new heat treating techniques.

Let this brand-new tool steel prove itself to you! ● Write for details—*use the coupon below*—let us help you to work out D-B-L's application on your jobs.

ALLEGHENY LUDLUM STEEL CORPORATION,
Dept. A, Tool Steel Division,
Watervliet, N. Y.

Send me descriptive material and test data on your new D-B-L Steel.

Name _____

Company _____

Address _____

ALLEGHENY LUDLUM
STEEL CORPORATION — PITTSBURGH, PA.
Fine Steel Headquarters

▲▲▲ THE IRON AGE ▲▲▲

SEPTEMBER 7, 1939

ESTABLISHED 1855

Vol. 144, No. 10

Twenty-One Cents on the Dollar

TWENTY-ONE cents on the dollar. That is a high percentage. And that is the "kick back" that the tax collector extracts from every dollar of present day national income in the United States of America.

At that, we are short-changing our creditors. For tax collections fall far short of meeting the annual expenditures of the most wasteful and profligate Administration that America has ever known. If we paid our bills "on the nail," the kick back would be between 30 and 35 cents on the dollar instead of 21 cents. We are making a present of the difference to posterity. A present in reverse to put it correctly.

Every man, woman and child in the United States averages a present day tax impost of $114.09 per annum. And by the same token, he, she or it signs a note, in addition, for the future payment of some $35 per year for the annual present Federal deficit.

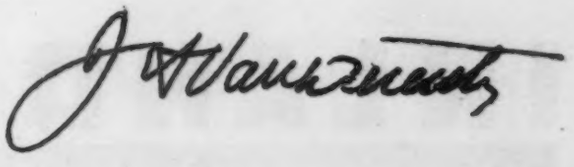
When you consider that the annual per capita income for 1938 was only a bit over $500, this Government check-off means real money.

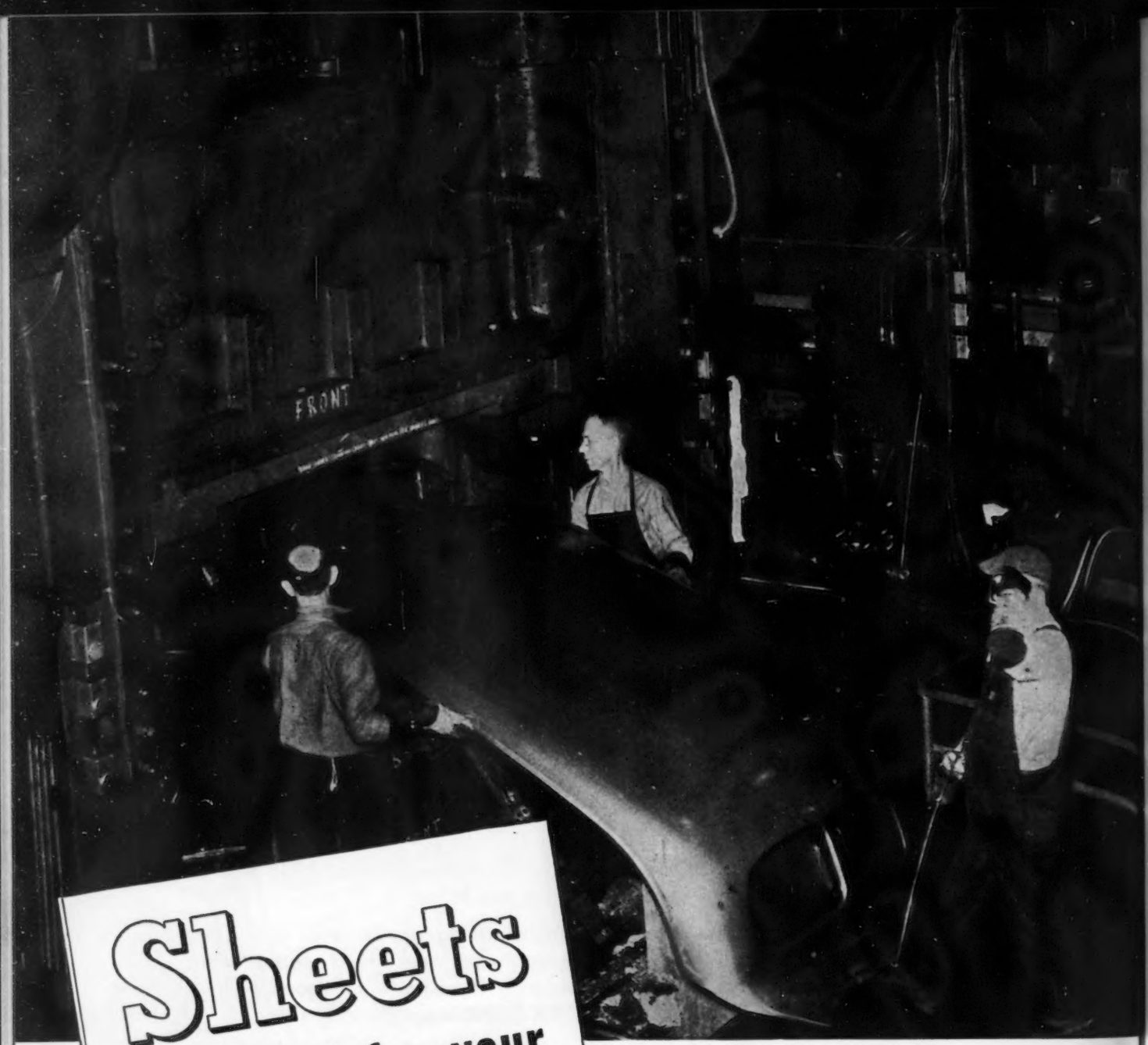
We did not dig up these astonishing and alarming figures. Who did? The Treasury Department of the United States. The Treasury last week issued a report on the subject of taxation, Federal, State and local. Evidently it believes it is good policy to bring this tax matter before the public before the Republicans do it in 1940.

And so the Treasury Department is asking business for suggestions as to ways and means of making taxation less burdensome. Less burdensome on the employer and on the wage earner. Coincidentally, this appeal to business came after the AFL of New York State had revealed to the wage earners that approximately 20 cents out of every wage dollar was being knocked off by Uncle Sam.

We hesitate to say "we told you so." Prophets, as you know, are without honor in their own country. But at the risk of unpopularity, let us remind you that year after year we have predicted that New Deal extravagance would come home to roost upon the shoulders of American labor. We agree one hundred per cent with President Roosevelt that "taxes are paid in the sweat of every man who labors." And we might also add: "In the suffering and privation of every widow who lives upon life insurance or other investment income."

There is one solution to this tax problem. Put men in power in our Government who know what it means and what it takes to earn a dollar. And who know how much harder it is to save that dollar than it was to earn it.





Sheets developed for your exact needs

WHATEVER PRODUCT you make, your sheet steel requirements are peculiar to it—exacting. No one realizes this better than does Inland.

In serving many industries with hot and cold rolled sheets, Inland is called upon to develop and supply sheets with special properties to better meet such requirements as deep drawing, forming, welding, finishing—and scores of others. Inland does this as a matter of course—and co-operates with a thoroughness that may surprise you.

The chances are good that Inland metallurgists, with their broad experience, have already solved many of your problems and that they can aid you materially in improving your products or in reducing your costs.

An Inland specialist will gladly discuss the matter with you, without obligation.

INLAND STEEL CO.

38 South Dearborn Street, CHICAGO • District Offices: DETROIT • KANSAS CITY • MILWAUKEE • ST. LOUIS • ST. PAUL

SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

STEEL STANDARDIZATION

By A. L. HARTLEY
Metallurgist, R. K. LeBlond Machine Tool Co., Cincinnati

o o o

IT is a recognized fact that a very efficient general steel standardization program has been in effect for several years. The purpose of this discussion is to show how a much more specialized program can be established for a given organization or group of organizations engaged in the production of related products.

The series of steels known as the SAE grades are well standardized for general use over a widely diversified field. However, there are over 100 SAE grades generally listed; in addition to these items there are probably 1000 to 1500 different trade-name steels on the market (not including the stainless steels). These steels have overlapping physical properties, and, in the case of trade name steels it is not infrequent to find the analyses almost identical. The data in Tables I to VI (Tables III to VI to appear next week) indicate to some extent this overlapping of analyses and physical properties.

The purpose of a specialized standardization program is basically two fold: *To improve the products and at the same time to reduce the net cost.* Both of these purposes can definitely be accomplished by such a program.

Most manufacturers have set up some limitations to which their designers must conform. However, it is not infrequent that large organizations have many overlapping grades of steel. This condition is particularly prevalent where trade-name materials are used. There are very few machines that cannot be fabricated satisfactorily from five grades of steel. But still, there are bound always to be parts that necessitate the use of special-purpose materials. For this reason it is usually desirable to carefully select approximately five grades of special-purpose steels to supplement the general-purpose materials. The adoption of a limited number of standard and special-purpose steels will usually result in a better product more economically produced.

BETTER products at lower costs, these two constantly-sought-for objectives, are available through the application of steel standardization described herein. This is Section I of a five-part article. The entire manuscript is copyrighted, 1939, by A. L. Hartley. In this, Section I, the author presents the characteristics of SAE steels most generally used by machine tool builders, and sets forth the effects of various alloying elements on steel.

Such a program will reduce the total number of types or cycles of heat treatment required. And, naturally, this will result in better work because the heat-treater will have a better opportunity to study the characteristics of the smaller number of standard materials handled and will become more thoroughly familiar with any peculiarities involved. The finished product will be further improved because the steel can be purchased to much more rigid specifications when ordered in the larger quantities made possible by reducing the number of items stocked. Also, the net cost of material is appreciably reduced because of the quantity discounts. For example:

The quantity extra applied on cold-drawn SAE 4145 steel, when purchased in lots of 300 lb. or less, is $2.50 per 100 lb.; this drops to 20c. per 100 lb. when purchased in lots of two to three tons, and to base price when purchased in lots of five to ten tons.

In addition to the quantity extra involved, the smaller purchases are usually made from a warehouse which must necessarily add an additional handling charge. An actual check of records has shown an example where the cost of a given steel dropped from $8.77 per 100 lb., when purchased in small quantities prior to a carefully

TABLE
Characteristics of

Trade Name or S. A. E. Number	Are There More Than Three Sources of Supply	ANALYSIS							COLD DRAWN PROPERTIES									
		Carbon Content; Allowable Variation ±0.05 Per Cent	Manganese	Nickel	Chromium	Molybdenum	Phosphorus, Max.	Sulphur, Max.	Approximate Machineability, Compared to 1112 as 100 Per Cent	Can Steel be Satisfactorily					Average Brinell Hardness	Yield, 1000 Lb. Per Sq. In.	Per Cent Reduction in Area	Is Steel Susceptible to Defects? c
										Turned	Formed	Drilled	Tapped	Threaded				
1010	Y	0.100	0.30–0.60				0.045	0.055	50						137	55	52	
1015	Y	0.15	0.30–0.60				0.045	0.055	50						146	60	52	
X-1015	Y	0.15	0.70–1.0				0.045	0.055	70						149	65	52	
1020	Y	0.20	0.30–0.60				0.045	0.055	60						156	63	50	
X-1020	Y	0.20	0.70–1.0				0.045	0.055	70						177	65	52	
1025	Y	0.25	0.30–0.60				0.045	0.055	65						156	65	50	
1112†	Y	0.12	0.60–0.90				0.13	0.200	100						174	60	42	
X-1112†	Y	0.12	0.60–0.90				0.13	0.300	125						179	60	40	
1115	Y	0.15	0.70–1.0				0.045	0.150	80						149	65	50	
1120	Y	0.20	0.60–0.90				0.045	0.150	81						156	65	50	
X-1314	Y	0.15	1.0 –1.3				0.045	0.050	90						169	68	50	
X-1315	Y	0.15	1.3 –1.6				0.045	0.150	90						169	70	50	
2015	Y	0.15	0.30–0.60	0.40–0.60			0.040	0.050	52						169	80	59	
2115	Y	0.15	0.30–0.60	1.25–1.75			0.040	0.050	55									
2315	Y	0.15	0.30–0.60	3.25–3.75			0.040	0.050	50						187	80	55	
2320	Y	0.20	0.30–0.60	3.25–3.75			0.040	0.050	52						197	82	55	
2515	Y	0.15	0.30–0.60	4.75–5.25			0.040	0.050	45						217	90	50	
3115	Y	0.15	0.30–0.60	1.00–1.50	0.45–0.75		0.040	0.050	55						187	75	53	
3120	Y	0.20	0.30–0.60	1.00–1.50	0.45–0.75		0.040	0.050	53						197	80	50	
3215	Y	0.15	0.30–0.60	1.50–2.00	0.90–1.25		0.040	0.050	50									
3220	Y	0.20	0.30–0.60	1.50–2.00	0.90–1.25		0.040	0.050	50						212	85	48	
3312a	Y	0.17M	0.30–0.60	3.25–3.75	1.25–1.75		0.040	0.050	44						241	90	50	
3415	Y	0.15	0.30–0.60	2.75–3.25	0.60–0.95		0.040	0.050	47									
4615	Y	0.15	0.40–0.70	1.65–2.00		0.20–0.30	0.040	0.050	66						207	80	55	
4620	Y	0.20	0.40–0.70	1.65–2.00		0.20–0.30	0.040	0.050	66						217	85	50	
4815	Y	0.15	0.40–0.60	3.25–3.75		0.20–0.30	0.040	0.050	47						217	95	50	
4820	Y	0.20	0.40–0.60	3.25–3.75		0.20–0.30	0.040	0.050	45						223	100	47	
5120b	Y	0.20	0.30–0.60		0.60–0.90		0.040	0.050	60						183	90	60	
6115b	Y	0.15	0.30–0.60		0.80–1.10		0.040	0.060	50						197	85	50	
6120	Y	0.20	0.30–0.60		0.80–1.10		0.040	0.040	50						207	85	52	

CHART KEY AND GENERAL REMARKS: † Carbon range ±0.04. *a* Carbon range 0.17 maximum. *b* Vanadium, 0.15 minimum, 0.18 desired. *c* Some grades of steel are more susceptible to defects such as seams, pipes, inclusions, etc., than others. This characteristic should be studied before selecting a standard steel. *d* The physical properties of all grades of steel decrease as the mass increases. However, the percent decrease depends on the analysis. If highly stressed parts are used, the mass effect must be considered. *e* Warehouse data are approximate and subject to revision. *f* Price data are subject to revision and should only be used for comparisons. *g* The tabulated temperatures shown in this column are only approximate. *j* Uniformity of case hardness depends on the car-

planned standardization program, to $5.33 per 100 lb. when purchased in larger quantities after the program was in operation. This is a net reduction of $68.80 per ton. Such outstanding examples are not typical, but in most cases a net reduction of $15 to $20 per ton can be consistently averaged. This would amount to a saving of approximately $5250 per year in a plant using 300 tons of steel bar stock. But, this figure represents only the direct savings in material costs. In addition, as previously stated, the better specifications which are made possible will result in a more uniform material, which in turn will improve machineability, and will reduce machining costs, machining spoilage and heat treating losses.

General Outline

The establishment of an efficient steel standardization program must be

ONE
Carburizing Steels

Core Properties 1 In. Section, High Temperature Quench in Oil or Water as Required for the Given Steel (HT)							Core Properties, 1 In. Section, High and Low Temperature Quench in Oil or Water as Required for the Given Steel							CASE PROPERTIES								Is Steel Stocked in Complete Size Ranges (Warehouse)							
															Is the Case Uniformly Hard (R_c 59 Min.) and Free From Soft Spots *j*													
Approximate Machineability, Compared with 1112 as 100 Per Cent	Yield, 1000 Lb. Per Sq. In.	Per Cent Reduction in Area	Izod Values, Ft.-Lb.	Brinell Hardness	Are Corners Machineable When C and Mn are High? *z*	Do Properties Decrease Rapidly in Heavy Sections? *d*	Approximate Machineability, Compared with 1112 as 100 Per Cent	Yield, 1000 Lb. Per Sq. In.	Per Cent Reduction in Area	Izod Values, Ft.-Lb.	Brinell Hardness	Are Corners Machineable When C and Mn are High? *z*	Do Properties Decrease Rapidly in Heavy Sections? *d*	Carburizing Rate, Compared with S. A. E. 1020 as 100 Per Cent	1 In. Dia. x 12 In. Long	2 In. Dia. x 12 In. Long	3 In. Dia. x 12 In. Long	4 In. Dia. x 12 In. Long	6 In. Dia. x 12 In. Long	Temperature Required to Reduce Case Hardness to 58 R_c *g*	Is Soft Skin Formed?	Rounds, H.R.	Rounds, C.D.	Squares, H.R. *e*	Squares, C.D.	Flats, H.R.	Flats, C. D.	Hexagons, C.D.	Base Price Plus Alloy Extra (Hot Rolled) *f*
40					Y							Y		100						400		N	N	N	N	N	N	N	2.15
42					Y							Y		100						400		N	N	N	N	N	N	N	2.15
40					Y							Y		100						400		N	N	N	N	N	N	N	2.15
					Y							Y		100						400		Y	Y	Y	Y	Y	Y	Y	2.15
55					Y							Y		100						400		Y	Y	Y	Y	Y	Y	Y	2.15
60					Y							Y								400		Y	N	N	N	N	N	N	2.15
90					Y							Y								400		L	Y	N	L	N	N	Y	2.25
					Y							Y								400		N	Y	N	N	N	N	Y	2.325
					Y							Y								400		N	Y	N	N	N	N	N	2.25
					Y							Y								400		Y	Y	N	N	N	N	L	2.25
	70	55	50	223	N			57	58	40	187	Y		120						400		Y	Y	N	N	N	N	Y	2.35
					N							Y								400		Y	Y	N	N	N	N	Y	2.50
	50	78	95	156	Y			47	78	105	143	Y		95						400		N	N	N	N	N	N	N	3.05
	100	45	35	269	H			60	70	70	187	Y		80						400		N	N	N	N	N	N	N	3.45
	130	47	40	321	H			90	46	63	248	Y		80						400		Y	Y	L	N	N	N	L	4.25
	117	45		302	H			95	44	58	255	Y								400		Y	Y	Y	N	N	N	Y	4.25
	160	50	30	375	N			70	65	75	217	H		80						375		L	L	N	N	N	N	N	4.95
	95	55	40	269	Y			85	41	30	241	Y		107						450		Y	Y	N	N	N	N	L	3.40
	100	51	40	277	H			90	42	32	269	H								450		Y	Y	N	N	N	N	L	3.40
	115	50	50	331	H			98	48	42	302	H										N	N	N	N	N	N	N	4.05
	120	50	48	341	N			102	45	40	311	H										N	N	N	N	N	N	N	4.05
	180	57	40	415	N			150	60	50	401	N										L	N	N	N	N	N	N	6.50
	165	45	25	415	N			105	55	60	302	H										L	N	N	N	N	N	N	5.90
	100	53	60	269	Y			73	58	85	212	Y		95						600		Y	L	N	N	N	N	N	3.80
	109	52	50	277	Y			90	55	70	269	Y		95						600		Y	L	N	N	N	N	N	3.80
	135	55	50	363	H			80	50	60	269	Y		90						600		N	N	N	N	N	N	N	4.70
	140	50	30	375	H			100	50	50	302	Y		90						600		N	N	N	N	N	N	N	4.70
	100	48		277	Y							Y										N	N	N	N	N	N	N	3.05
	105	49		241	H			70	37		207	Y										N	N	N	N	N	N	N	3.90
	112	52		302	H			80	45		241	Y										N	N	N	N	N	N	N	3.90

burizing and hardening technique employed as well as the characteristics of the steel. Care should be exercised to select steels that can be satisfactorily treated with available apparatus. *z*Are the corners machineable when the carbon and manganese are on the high side of the analysis range? N—No, or not machineable under ordinary conditions. Y—Yes. C.D.—Cold drawn. H.R.—Hot Rolled. HT—Specimen quenched from the proper core refining re-heat temperature and not directly from the carburizing box. H—The corners can only be machined under favorable conditions. L—Limited stock available.

carefully considered from several objectives, namely:

(1) The general types of steel required for parts fabricated from bar stock and forgings.

(2) An analysis of the physical and metallurgical requirements of each of the various types.

(3) An analysis of the relative merits and net costs of the various types of bar stock finishes.

(4) The establishment of purchasing specifications.

(5) The establishment of a materials inspection program.

(6) The establishment of a code system for each of the various grades of steel and for each heat treatment.

Each of these six objectives will be considered in detail:

In the first objective, types of materials generally required are considered. The requirements of each of the various types of steel are outlined and six

TABLE
General Purpose

Trade Name or S. A. E. Number	ANALYSIS								Physical Properties of Fine Grain Steel Heat Treated to a Lamellar Pearlitic Structure, Except Straight-Carbon or Carbon-Manganese Steels of 0.40 Carbon or Less Which are Listed in the Processed Condition. (Treated in 1 In. Diameter Sections)									
	Carbon Content, Allowable Variation ±0.05 Per Cent	Manganese	Nickel	Chromium	Molybdenum	Vanadium	Phosphorus, Maximum	Sulphur, Maximum	Brinell, H.R.	Yield, 1000 Lb. Per Sq. In., H.R.	Per Cent Reduction Area, H.R.	Machineability, H.R. Compared with 1112 as 100 Per Cent *d*	Can Steel be Satisfactorily				Brinell, C.D.	Machineability, C.D. Compared with 1112 as 100 Per Cent (3ct)
													Turned	Formed	Drilled	Tapped		
1035	0.35	0.60–0.90					0.045	0.055	163	48	56						187	65
T-1335	0.35	1.60–1.90					0.04	0.05	197	62	60						212	50
X-1335	0.35	1.35–1.65					0.045	0.15†	212	60	45						235	70
2335	0.35	0.50–0.80	3.25–3.75				0.04	0.05	197	65	55						217	40
3135	0.35	0.50–0.80	1.00–1.50	0.45–0.75			0.04	0.05	197	65	55						207	53
3235	0.35	0.30–0.60	1.50–2.00	0.90–1.25			0.04	0.05	207	68	55						235	45
3435	0.35	0.30–0.60	2.75–3.25	0.60–0.95			0.04	0.05	196	62	55						241	39
4135	0.35	0.60–0.90		0.80–1.10	0.15–0.25		0.04	0.05	187	65	58						207	55
6135	0.35	0.60–0.90		0.80–1.10		0.15–0.18	0.04	0.05	187	65	50						207	50
1040	0.40	0.60–0.90					0.045	0.055	179	55	54						197	60
T-1340	0.40	1.60–1.90					0.04	0.05	212	70	58						235	47
X-1340	0.40	1.35–1.65					0.045	0.15†	197	65	60						223	70
2340	0.40	0.60–0.90	3.25–3.75				0.04	0.05	201	68	48						223	37
3140	0.40	0.60–0.90	1.00–1.50	0.45–0.75			0.04	0.05	207	65	55						212	48
X-3140	0.40	0.60–0.90	1.00–1.50	0.60–0.90			0.04	0.05	207	65	55						212	45
3240	0.40	0.30–0.60	1.50–2.00	0.90–1.25			0.04	0.05	207	71	58						223	40
3340	0.40	0.30–0.60	3.25–3.75	1.25–1.75			0.04	0.05	228	90	55						255	35
4140	0.40	0.60–0.90		0.80–1.10	0.15–0.25		0.04	0.05	192	70	53						212	52
4340	0.40	0.50–0.80	1.50–2.00	0.50–0.80	0.30–0.40		0.04	0.05	293	125	58							
4640	0.40	0.50–0.80	1.65–2.00		0.20–0.30		0.04	0.05	212	90	40							
5140	0.40	0.60–0.90		0.80–1.10			0.04	0.05	187	55	62						207	46
6140	0.40	0.60–0.90		0.80–1.10		0.15–0.18	0.04	0.05	201	75	54						212	46
1045	0.45	0.60–0.90					0.045	0.055	187	60	52						207	58
X-1045	0.45	0.40–0.70					0.045	0.055										
T-1345	0.45	1.60–1.90					0.04	0.05	212								229	
2345	0.45	0.60–0.90	3.25–3.75				0.04	0.05	212	75	45						229	35
3145	0.45	0.60–0.90	1.00–1.50	0.45–0.75			0.04	0.05	212	75	52						223	46
3245	0.45	0.30–0.60	1.50–2.00	0.90–1.25			0.04	0.05	212	75	55							
4145	0.45	0.60–0.90		0.80–1.10	0.15–0.25		0.04	0.05	207								223	48
4345	0.45	0.50–0.80	1.50–2.00	0.50–0.80	0.30–0.40		0.04	0.05										
6145	0.45	0.60–0.90		0.80–1.10		0.15–0.18	0.04	0.05	207								223	45
1050	0.50	0.60–0.90					0.045	0.055	197	65	50						212	55
X-1050	0.50	0.40–0.70					0.045	0.055										
T-1350	0.50	1.60–1.90					0.04	0.05	197	60	20						229	
2350	0.50	0.60–0.90	3.25–3.75				0.04	0.05	217	80	42						235	28
3150	0.50	0.60–0.90	1.00–1.50	0.45–0.75			0.04	0.05	217	73	50						228	40
3250	0.50	0.30–0.60	1.50–2.00	0.90–1.25			0.04	0.05	235	85	55							38
3450	0.50	0.30–0.60	2.75–3.25	0.60–0.95			0.04	0.05	241	100	55							30
4150	0.50	0.60–0.70		0.80–1.10	0.15–0.25		0.04	0.05	212	72	53						228	46
5150	0.50	0.60–0.90		0.80–1.10			0.04	0.05	212	70	55						217	40
6150	0.50	0.60–0.90		0.80–1.10		0.15–0.18	0.04	0.05	207	75	50						229	40

CHART KEY AND GENERAL REMARKS: † Sulphur, 0.075 to 0.15. *a* The physical properties of all grades of steel decrease as the mass increases. However, the percent decrease depends on the analysis. *b* Warehouse data are only approximate and are subject to revisions. *c* Price data are subject to revisions and should only be used for comparisons. *d* Data not available. L—Limited stock available. N—No. Y—Yes. C.D.—Cold drawn. H.R.—Hot rolled.

TWO
Engineering Steels

Physical Properties of Fine Grain Steel Treated to Maximum Hardness Within the Practical Machining Range for Average Production Work						Physical Properties of Fine Grain Steel, Hardened and Tempered at 400 deg. F. (1 In. Diameter Section)						As—Quenched, Surface Hardness of Fine Grain Steel, in Sections of the Following Sizes:						As—Quenched, Core Hardness of Fine Grain Steel in Sections of the Following Sizes:						Is Steel Stocked in Commercial Warehouses in Complete Size Ranges of: *b*							
Brinell Hardness	Yield 1000 Lb. Per Sq. In.	Per Cent Reduction in Area	Izod Values, Ft.-Lb.	Fatigue, 1000 Lb. Per Sq. In.	Do Properties Decrease Rapidly in Heavy Sections? *a*	Brinell Hardness	Yield, 1000 Lb. Per Sq. In.	Per Cent Reduction in Area	Izod Values, Ft.-Lb.	Fatigue, 1000 Lb. Per Sq. In. (N)	Do Properties Decrease Rapidly in Heavy Sections? *a*	1 In. Dia. x 12 In.	2 In. Dia. x 12 In.	3 In. Dia. x 12 In.	4 In. Dia. x 12 In.	6 In. Dia. x 12 In.	8 In. Dia. x 12 In.	1 In. Dia. x 12 In.	2 In. Dia. x 12 In.	3 In. Dia. x 12 In.	4 In. Dia. x 12 In.	6 In. Dia. x 12 In.	8 In. Dia. x 12 In.	Rounds, H.R.	Rounds, C.D.	Squares, H.R.	Squares, C.D.	Flats, H. R.	Flats, C. D.	Hexagons, C.D.	Base Price Plus Alloy Extra, H.R. *c*
248	85	50	40			302	100	35	17															Y	Y	N	N	N	N	N	2.20
269	115	55	43																					N	N	N	N	N	N	N	2.80
																								Y	L	N	N	N	N	N	2.45
302	120	55	37	74		444	222	37	8.5	120														Y	L	N	N	N	N	L	4.25
302	120	56	51	75		444	205	29	10	118														Y	Y	L	L	N	N	Y	3.40
285	115	55	60			495	245	36	18															N	N	N	N	N	N	N	4.05
302	132	60	47	75		461	224	45	19	122														N	N	N	N	N	N	N	5.90
363	170	53	23			495	237	38																N	N	N	N	N	N	N	3.25
302	125	65	37			461	160	40	15															N	N	N	N	N	N	N	3.90
248	90	45	38			364	120	20	12															Y	Y	L	L	N	N	N	2.20
269	115	55	32																					N	N	N	N	N	N	N	2.80
																								N	N	N	N	N	N	N	2.45
302	120	60	50	68		477	234	35	10	127														Y	N	N	N	N	N	N	4.25
302	124	56	50	75		477	217	25	9	123														Y	Y	L	L	N	N	Y	3.40
302	124	57	50	75		495	230	23	9	130														Y	Y	L	L	N	N	Y	3.40
302	125	58	58	72		514	230	35	16	133		555	555	534	534	534		534	534	478	401	375		N	N	N	N	N	N	N	4.05
302	132	56	47	76		495	247	40	15	135														Y	N	N	N	N	N	N	6.50
363	163	50	38	73		514	250	32	10	125		601	555	461	429	401	401	578	514	401	341	331	321	Y	Y	L	L	N	N	L	3.25
401	200	48	15	90		514	275	45	15	140		578	578	555	495	495	495	578	555	555	495	471	444	Y	N	N	N	N	N	N	4.55
363	160	50	27	81		534	240	38	14	135		601	578	555				601	461	302				N	N	N	N	N	N	N	3.80
302	125	60	40			534	210	20	8															L	N	N	N	N	N	N	3.15
302	130	55	35			514	220	35	12															N	N	N	N	N	N	N	3.90
248	92	50	35																					Y	Y	L	L	Y	N	L	2.20
248	90	51	32																					N	N	N	N	N	N	N	2.20
269	115	55				514	220	23																N	N	N	N	N	N	N	2.80
302	125	60	42	70		514	238	32	9	133														Y	N	N	N	N	N	N	4.25
302	129	55	46	75		495	224	24	7	126														Y	N	N	N	N	N	N	3.40
302	126	57	51	73		514	232	33	13	137														N	N	N	N	N	N	N	4.05
363	167	50	32	83		555	260	30	10	130		601	601	578				601	601	429				Y	N	N	N	N	N	N	3.25
401																								N	N	N	N	N	N	N	4.35
302	135	50	37			555	225																	Y	N	L	N	L	N	N	3.90
285	115	40	20																					N	N	N	N	N	N	N	2.20
																								N	N	N	N	N	N	N	2.20
302	130	40																						N	N	N	N	N	N	N	2.80
302	124	59	35	67		534	240	30	6	139														Y	N	N	N	N	N	N	4.25
302	130	54	46	75		495	231	23	4	129														L	N	N	N	N	N	N	3.40
302	127	56	44	74		534	234	31	9	140														Y	N	N	N	N	N	N	4.05
302	125	56		75		514	250	38	12	136														N	N	N	N	N	N	N	5.90
363	175	49	32	87		555	260	25	9	135		627	627	601				627	627	555				Y	N	N	N	N	N	N	3.25
302	122	55	37			555	235	23																N	N	N	N	N	N	N	3.15
302	135	50	32			601	260		4															N	N	N	N	N	N	N	3.90

M—Approximate average values from available published data. S. A. E. 1112 can usually be turned at a surface speed of approximately 160 ft. per min. N—The values listed in this column are based on a constant fatigue tensile ratio factor. It has been proved that this ratio factor is not a constant for steel above 450 Brinell hardness. Actual fatigue tests would probably not result in values in excess of 100,000 lb. per sq. in. for any of the steels involved. The values tabulated merely indicate the trend.

tabular charts are reproduced. These charts, or tables, give the analyses and some of the physical characteristics of each type of steel considered. In addition to these tables, a very brief tabular presentation at the end of this article shows the effect of most of the alloying elements on the physical and metallurgical properties of steel. (Herein and in Sept. 14 issue.)

In the second objective, the general requirements of each of the various types of steel are discussed and considered in a general manner. This portion is summarized by listing in tabular form a recommended group of steels which is felt would be suitable for all requirements encountered in most plants that manufacture mechanical equipment such as machine tools, etc. (To appear in Sept. 21 issue.)

In the third objective, the various types of bar stock finish are considered; the relative commercial tolerances are outlined, and the economic advantages of using the various finishes are illustrated by concrete examples. The economic advantages of reducing the number of finishes and sizes to an absolute minimum is thoroughly discussed. Round, square, flat and hexagon stock are considered. (To appear in Sept. 21 issue.)

In the fourth objective, a general outline of the properties which should be definitely specified are mentioned in a general manner, and typical purchasing specifications are shown and discussed in detail. (To appear in Sept. 28 issue.)

In the fifth objective, the necessity of a well planned materials inspection system is discussed and a suggested program, which can be economically applied, is outlined. (To appear in Oct. 5 issue.)

In the sixth and final objective, the advantages of using a code system for indicating the various grades of steel and heat treatments on drawings and records are considered. A suggested code system is briefly outlined. (To appear in Oct. 5 issue.)

Types of Steel Required

It is necessary to carefully analyze what types of steel are required for parts fabricated from bar stock and forgings, what is available and the net cost of each type considered. Each of the above items must be thoroughly expanded to cover the many detail problems involved. To clearly point out some of these problems, a hypothetical program will be discussed.

A plant engaged in the manufacture of mechanical equipment such as machine tools, etc. generally requires the following types of steel:

CLASS I — General Application Steel (Stock Materials): (1) screw stock; (2) low-carbon or low-carbon-manganese carburizing steel; (3) medium carbon or medium carbon manganese steel; (4) alloy oil-hardening steel; (5) alloy carburizing steel; and (6) high-carbon tool steel.

CLASS II — Special Application Steel (Purchased to requirements or stocked in very limited quantities): (1) an alloy oil-hardening steel with higher alloy content than (4) above; (2) non-deforming oil-hardening tool steel; (3) shock-resisting alloy tool steel; (4) abrasion-resisting alloy tool steel; and (5) high-speed tool steel 18-4-2 plus molybdenum type.

The selection of the grades of steel as outlined requires a very careful analysis of the available items. To assist in making this analysis six tables have been prepared. An attempt has been made to show the major characteristics of the SAE grades involved and to tabulate some of the more prominent trade-name tool steels of the types considered. It should be thoroughly understood that *tabulated data of this type cannot show all of the many variables that may be encountered.* However, the tables do show some average expectancy values and may be employed as a helpful guide.

Tables I and II show the analyses and physical characteristics of the SAE steel most frequently employed by machine tool buiders. It has been necessary to leave many of the columns blank or only partially filled in, either because the data is not available or because it was not deemed advisable to make an unrestricted tabular statement. That is, for example, in Tables I and II, under the columns "Can Steel be Successfully Turned, Formed, Drilled, Tapped, Threaded," a result that might be considered satisfactory in one plant would be unacceptable in another. However, such columns were included on the chart because the factors involved should be considered.

Effect of Alloying

Although the effects of the various alloying elements are rather complex and inter-related, a very brief resume of the general results caused by the addition of each may be helpful in the analysis of data shown in Tables I to VI. (Tables III to VI to be published next week.) However, it must be emphasized that this information is only general and frequently cannot apply, especially in the cases of more complex alloy steels.

CARBON: (1) Hardness increased; (2) yield point increased; (3) tensile strength increased; (4) ductility decreased; (5) impact decreased; (6) machineability decreased; (7) wear resistance improved; and (8) hardening temperature decreased up to the eutectoid, usually about 0.80 to 0.90 per cent carbon depending on the type of steel.

MANGANESE (High-manganese steels not considered): (1) Hardness increased; (2) depth hardening increased; (3) yield point increased; (4) tensile strength increased; (5) hardening temperature decreased; (6) critical hardening rate decreased; (7) soundness of steel improved because manganese acts as a deoxidizer and tends to counteract the harmful effects of sulphur; and (8) distortion in hardening decreased.

PHOSPHORUS: (1) Generally harmful in the grades of steel considered in this discussion; (2) increases yield in some of the low-carbon grades; and (3) increases corrosion resistance in some of the low-alloy steels.

SULPHUR: (1) Machineability increased; and (2) physical properties decreased (within certain limits the harmful effects can be offset by the use of manganese and/or molybdenum).

SILICON: (1) Depth hardening properties improved with the addition of small amounts, as for instance 0.10 to 0.50 per cent; (2) impact improved (when used in proper combination with other elements, as shown in Table IV); (3) grain growth increased; (4) hardening temperature increased; and (5) rate of decarburization increased.

NICKEL: (1) Hardness increased; (2) depth of hardness increased; (3) yield point increased; (4) tensile strength increased; (5) ductility increased; (6) impact increased (most nickel-steels have a temper-brittle range that should be avoided in specifying heat treatments); (7) machineability decreased; (8) hardening temperature decreased; (9) critical hardening rate decreased; and (10) rate of grain growth at elevated temperature retarded, especially when present in alloys with chromium and/or molybdenum.

CHROMIUM: (1) Hardness increased; (2) depth of hardness increased; (3) yield point increased, (4) tensile strength increased; (5) ductility decreased; (6) impact de-

creased (temper brittleness encountered in some grades of chromium and chromium-nickel steels); (7) machineability decreased; (8) hardening temperature increased; (9) critical hardening rate decreased (higher chromium steels are air hardening); (10) wear resistance improved; and (11) hardness at high temperature improved.

MOLYBDENUM: (1) Depth of hardness increased; (2) yield point increased; (3) tensile strength increased; (4) tensile strength at elevated temperature increased; (5) ductility increased; (6) impact increased; (7) machineability (at high hardness) improved; (8) hardening temperature slightly increased; (9) grain growth at elevated temperature retarded; and (10) weldability not affected (probably the only alloy added to steel that is not harmful to the welding characteristics).

VANADIUM: (1) Increases hardness (when quenched from sufficiently high temperature to permit solution of vanadium carbides); (2) depth of hardness, (a) decreased when quenched from temperatures which do not dissolve vanadium carbides due to the fact that vanadium steels have a fine inherent grain size, and (b) increased when quenched from temperatures sufficiently high to permit solution of vanadium carbides; (3) tensile strength increased; (4) impact increased; (5) stability at high temperature improved (higher vanadium alloys as in high-speed steel increase in hardness at 900 deg. to 1200 deg. F.); and (6) cutting properties improved (in highly alloyed steels such as the high-speed tool steels).

TUNGSTEN: (1) Hardness increased; (2) depth of hardness increased; (3) tensile strength increased; (4) hardening temperature increased; (5) critical hardening rate decreased; (6) rate of grain growth at high temperature retarded; (7) stability at high temperature improved; and (8) wear resistance improved.

COBALT: (1) Impact decreased; (2) hardening temperature increased; (3) maximum hardness at high temperature increased; (4) stability at high temperature improved; and (5) decarburization in hardening increased.

Ed. Note:—Next week the author continues with tabulated data and discussions on the types of steel required for machine tool work.

CONVEYOR PACKAGING REDUCES ERRORS

THE recent installation of a conveyor for packing automotive replacement parts in boxes has greatly reduced errors and speeded up output at the Ashland Road plant of Thompson Products, Inc., Cleveland.

Two fabric belts, each about 18 ft. long, with variable speed drives, have been installed, integral with tables made of stainless steel. The department is well lighted by new General Electric fluorescent 40-watt lights. Part of the layout and equipment may be seen in the accompanying photo.

Items to be packed are laid on the tables along the belts in the proper order of their insertion into the boxes. As the boxes pass by on the belt, each girl packs the part assigned to her. Formerly one girl packed all required parts in each box, a slow process with many errors resulting.

Bolt assemblies, which consist of 26 separate items, can now be packed at the rate of 800 to 1100 per hr., and single item boxes are packed at the rate of 2000 per hr. While the girls work on one belt, parts are being placed along the other belt for another packing assignment.

Shackles are assembled on the belts and tightened with an air chuck. Taping of boxes is facilitated through the use of a newly developed automatic taping machine.

John Wagner, superintendent of the building, has also developed a number of special type tote boxes and trailers to facilitate handling.

CHOOSING A

Every finishing problem is bounded by certain fundamental considerations. This article recognizes these considerations and sets down guides for choosing the proper finish for any particular metal product.

o o o

By ADOLPH BREGMAN
Consulting Engineer, New York

o o o

REDUCED to its simplest terms, the salability of a metal product depends upon four factors:

(1) Function.
(2) Durability.
(3) Appearance.
(4) Cost.

The order of importance of these factors varies with different types and classes of work, but all of them are always present; and, in varying degrees, depending upon the class and design of the product. But, almost always to some extent at least, each of these factors is affected by the finish. For that reason, no more important task confronts the manufacturer than the choice of the most suitable finish.

Metal products are of seemingly endless variety: Consumer goods, industrial products, necessities, useful accessories, luxuries; and in a large number of instances, the boundaries between these classes are hazy. (Is that outstanding metal product, the automobile, a necessity or a luxury?) Nevertheless, they are susceptible to orderly classification and close examination will generally disclose the group to which a specific article belongs. In each class the order of importance of the four requirements given above is peculiar to itself, but in all classes *the finish must first aid the product in satisfying to the fullest extent its primary requirements*, and then aid the others as far as possible.

Without exception, the first requirement of any article is proper functioning. The product must do the work for which it is intended. Generally next in order is durability, followed by appearance and cost. Of course cases abound in which price or appearance is the factor which closes the sale, but this condition obtains where the other factors are about equal in competing articles.

As a general rule, therefore, the order of importance of these requirements for different types of metal goods may be listed as in Table I.

The fact that the order of these functions may in specific instances be affected by certain variables—a highly special product, the existing market price range of competing articles, the locality in which it is used, the habits of the buyers, and even general economic conditions—makes it necessary to allow for possible exceptions to the ratings in Table I. It is common knowledge that in times of depression, the factor of cost climbs high in the scale of importance. Although the consumer continues to demand "quality," the number of sales on price rises rapidly. It is not uncommon practice in developing a new line of consumer goods, first to set a price, based on the conditions of the market (slightly over to slightly under the competitors' figures, as the case may be) and then to design and develop the product to fit within that range. It is also well known that the growth of "style" has brought the factor of appearance much closer to the others in weight, even in the necessities.

In industrial products there is little variation in the primary requirements. They are utilitarian, and like the product the finish must also be primarily utilitarian. Consequently, satisfactory operation and durability rank far above appearance and even cost. Still, even here occasional exceptions must be allowed. The factor of appearance is beginning to make itself felt and, of course, the cost is an ever-present problem.

Finish for Consumer Necessity

To the experienced designer, the following, perhaps over-detailed analysis may seem elementary. A number of the individual steps listed will often

TABLE I
Requirements of Metal Products

Necessities	Useful Accessories	Luxuries
(1) Function	(1) Function	(1) Functioning
(2) Durability	(2) Durability	(2) Appearance
(3) Reasonable cost	(3) Appearance	(3) Durability
(4) Appearance	(4) Reasonable cost	(4) Reasonable cost

METAL FINISH

SIXTH in a Series of Articles on the Economic Aspects of Metal Cleaning and Finishing

be taken simultaneously. However, for the purpose of completeness, they will be set down here in sequence.

A good example of a consumer necessity is the lawn mower, generally made of steel and iron throughout. Its service involves rather severe physical handling, often abuse, and also exposure to moisture. It is clearly a utilitarian product and the demands of the user may, therefore, be listed in the following order of importance.

(1) Function.
(2) Durability.
(3) Reasonable cost.
(4) Attractive appearance.

In fulfilling these requirements in the order given, the finish must provide for protection against rust; it must adhere firmly, without chipping, flaking or peeling, under the numerous shocks and other forms of mishandling incident to the use of a lawn mower; it should be inexpensive as the market is competitive; and it should also be presentable in appearance, although this factor has always been considered the least important.

To satisfy these prerequisites it is possible to choose from a wide variety of finishes commercially available, which are listed[1] (in alphabetical order) in Table II.

Beginning by the process of elimination, it is possible to rule out immediately, for self-evident reasons, chemical colors (not durable enough), clad metals (cost), electrolytic oxides (no aluminum used), lithographing (not durable enough), polishing only (low rust resistance), porcelain enamels (danger of chipping under rough handling), rubber coats (cost), cementation coats (brittleness), sprayed metal (too expensive for small parts), vapor coats (cost). This leaves the following which might be used: Chemical rust-proofs, electroplates, hot dip coats, organic coats and paints. In Table III these finishes are listed in order of comparative effectiveness, under each of the four primary requirements, for the type of service peculiar to a lawn mower.

[1] Adapted from the chart shown in the first article of this series entitled, "Metal Cleaning and Finishing Economies," by Francis Juraschek, THE IRON AGE, Jan. 26, 1939, p. 21. This list includes only those finishes *commercially available*, omitting those which have been applied only in experimental fashion, even though successfully, and those which have made little commercial headway to date.

TABLE II

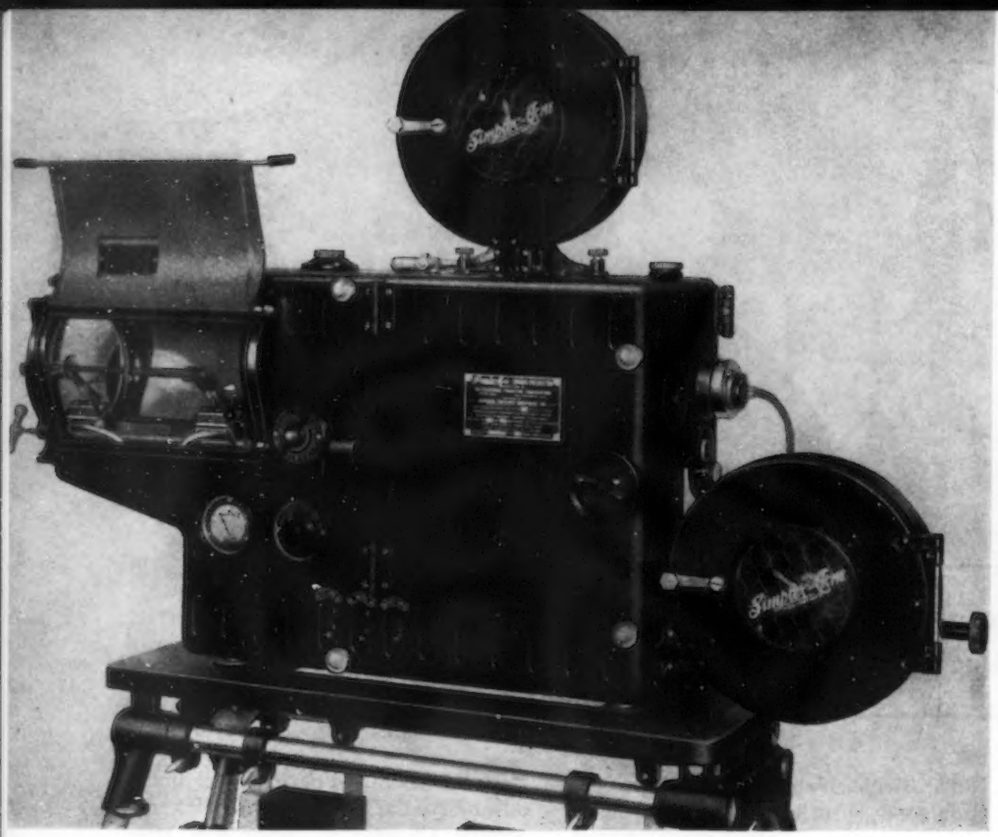
Types of Finishes Commercially Available

(1) Cementation coats:
  Zinc (Sherardizing)
  Aluminum (Calorizing)
(2) Chemical colors:
  Oxides, sulphides, etc.
  (Generally require covering with clear lacquer.)
(3) Chemical rustproofs:
  Oxides, phosphates, etc.
  (Parkerizing, Bower-Barff, etc.)
(4) Clad metals.
(5) Electroplates.
(6) Electrolytic oxides:
  On aluminum (Alumilite and Alzak).
(7) Hot-dip coats.
(8) Lithographing.
(9) Organic coats:
  Lacquers, synthetic enamels, including undercoats of chemical rustproofs.
(10) Paints:
  Including undercoats of chemical rustproofs.
(11) Polishing (only):
  High luster scratch, brush, etc.
(12) Porcelain enamels:
  Including art enamels.
(13) Rubber coats.
(14) Sprayed metals.
(15) Vapor coats:
  Including cathode sputtering.

In Table III exception may be taken to the order of listing in some instances. For example, under durability, the first four are close together. Changes in design will often affect the cost of electroplating. Under appearance, the first two finishes listed might easily be shuffled, depending upon taste of the designer. And needless to say, combinations of all of these finishes can be used, with numberless possibilities.

From examination of Table III the reasons are clear for the usual choice of paint, for this highly utilitarian object. With a paint finish the mower operates as satisfactorily as with any other finish. It is low in cost. Long life, under the abuse to which this machine is subjected is difficult for any finish to achieve, and attractive appearance has always been the last consideration. (The next step, determining the type of paint, the pigment, vehicle, etc., is another problem, the detailed analysis of which cannot be considered here, for lack of space.)

The changing attitude of manufacturers, however, is well illustrated by a most original solution to this particular problem which has been offered in a lawn mower built by Clemson Brothers, Inc., Middletown, N. Y., whose machine is made entirely of steel and die castings (except for the wooden roller). The handles are of steel tubing with a chromium plated grip. Chromium plate is used on the knurled knob for adjusting the bed knife; also on the roller adjustment lugs, the tie tube and the name designs on the wheels. The handle, wheels and gear housings are finished in baked yellow enamel. Durability of finish is achieved by plating to the same thicknesses required in the highest grade automobile work and the baked finishes



IN finishing this motion picture projector, electroplate and organic coatings are combined for protection and excellent appearance. o o o

are applied in the same fashion as the standard automobile body finishes.

Finishes for Luxury Product

The best example of an out-and-out luxury consumer product is, of course, jewelry. Taking as the example, specifically, an item of low or medium priced costume jewelry, made of brass, the requirements in order of importance are as follow:

(1) Function.
(2) Appearance.
(3) Durability.
(4) Reasonable cost.

In this instance, the first prerequisite is again satisfactory operation. Although the demands of service seem slight (even cheap jewelry is handled with some care), they must be met; the piece must hang together and remain in the place where it is attached. Durability is of secondary importance as the product may be outmoded before it is outworn. Cost is of less importance than in most other classes of merchandise; it sells on the desire of the buyer and on its own distinctive style. The requirement uppermost in the buyer's mind (taking satisfactory operation for granted) is appearance. So it is advisable to eliminate at once all finishes except those which are the most decorative: Chemical colors, electroplates (including electroplated colors), organic coats and art enamels.

And at this point the analysis must stop as the choice again rests (within the price range) upon the taste of the designer, who may use any one or any group of these finishes in combination. The possibilities are practically unlimited.

A less extreme example of a luxury product is the radio, in which the order of requirements is changed to:

(1) Satisfactory operation.
(2) Durability.
(3) Appearance.
(4) Low cost.

In this instance the distance between these requirements is greatly diminished, the first three being extremely close together. Appearance, though it is ranked third, is of vital importance and the cost is often a pressing consideration. Consequently, every conceivable combination of finishes is found: Electroplate, chemical colors and organic coatings in infinite variety. The functioning of the radio is hardly, if at all, affected by the outside finish; the life of the instrument depends upon the mechanism itself. The cost is also determined to a large extent by the construction of the instrument itself. The purpose of the finish is therefore mainly decoration.

Where protection from rust or atmospheric corrosion is required, it is provided by the decorative finish applied to a sufficient thickness. As in the case of the costume jewelry, therefore, the choice is limited to the decorative finishes. But again, within this group, the possibilities are innumerable and the decision rests entirely upon the skill and taste of the designer.

Industrial Finishes

In industry everything used in the plant may be classed as a necessity or a useful accessory. The few luxuries which may be found are rarely an integral part of the operating equipment, but are likely to be consumer products for use in the offices, etc. So, almost without exception, the order of requirements is as follows:

(1) Function.
(2) Durability.
(3) Low cost.
(4) Appearance.

The first example to come to mind of an industrial necessity is the machine tool. In this instance the first two requirements are very close together, with the third, cost, much less important and appearance a bad last. The primary function of the finish is protection against rust. So it must be chosen entirely on service, which restricts the choice to chemical rustproofs, hot-dip coats, organic coats, paints, rubber coats and sprayed metals. (Clad metals, theoretically, within this group may be written off immediately on the grounds of cost; also cementation coats which are not generally applicable to large pieces.) The others are either too expensive or insufficiently protective. The order of effectiveness under each requirement is given in Table IV.

Table IV explains the general use

TABLE III
Comparative Effectiveness of Finishes for Lawn Mower

Functioning	Durability	Reasonable Cost	Appearance
Protection from rust, the only requirement, varies with durability	Organic coats	Chemical rustproofs	Electroplates
	Paints	Paints	Organic coats
	Electroplates	Hot-dip coats	Paints
	Hot-dip coats	Organic coats	Hot-dip coats
	Chemical rustproofs	Electroplates	Chemical Rustproofs

of paint on the grounds of fair durability, low cost and fairly good appearance. Its durability is lower than some other finishes but it is so easily and inexpensively replaceable that its use is logical.

However, even this indispensable necessity, in which appearance is still the least consideration, is now feeling the influence of style. Some machine tools are now fitted with plated trim to improve their appearance and to stimulate the user to take better care of the tool, thus adding to its life and improving its operation.

Another utility product, fundamentally industrial in character but made for the use of the individual, shows to an even greater extent the influence of style. Air conditioning units for the householder are coated with lacquers and enamels, often in wrinkle finishes and also with chromium plated trim.

As an example of a useful industrial accessory consider a plant instrument —a temperature controller. Here the service of the finish calls for resistance to industrial atmosphere, over a wide range. Some places are fairly clean, but others subject instruments to much dust, heat and fumes. Functioning and durability are by far the most important. The finish must first of all protect the instrument to keep it in satisfactory operation, it must last, and although cost is far below these factors in importance, it is still an item. Attractive appearance is obviously the least consideration. Consequently, it is advisable to rule out all finishes which are primarily decorative, fragile, not highly protective, or too expensive, as for instance cementation coats, chemical colors, clad metals, electrolytic oxides on aluminum, lithographing, polishing only, porcelain enamels, rubber coats, sprayed metals and vapor coats. This leaves chemical rustproofs, electroplates, hot-dip coats, organic coats and paints. In this group the order under the four requirements would be as in Table V.

TABLE IV

Effectiveness of Finishes for Machine Tools

Functioning	Durability	Reasonable Cost	Appearance
Protection from rust, the only requirement, varies with durability.	Sprayed metals	Chemical rustproofs	Organic coats
	Rubber coats	Paints	Paints
	Paints	Hot-dip coats	Chemical rustproofs
	Hot-dip coats	Organic coats	Hot-dip coats
	Organic coats	Sprayed metals	Sprayed metals
	Chemical rustproofs	Rubber coats	Rubber coats

TABLE V

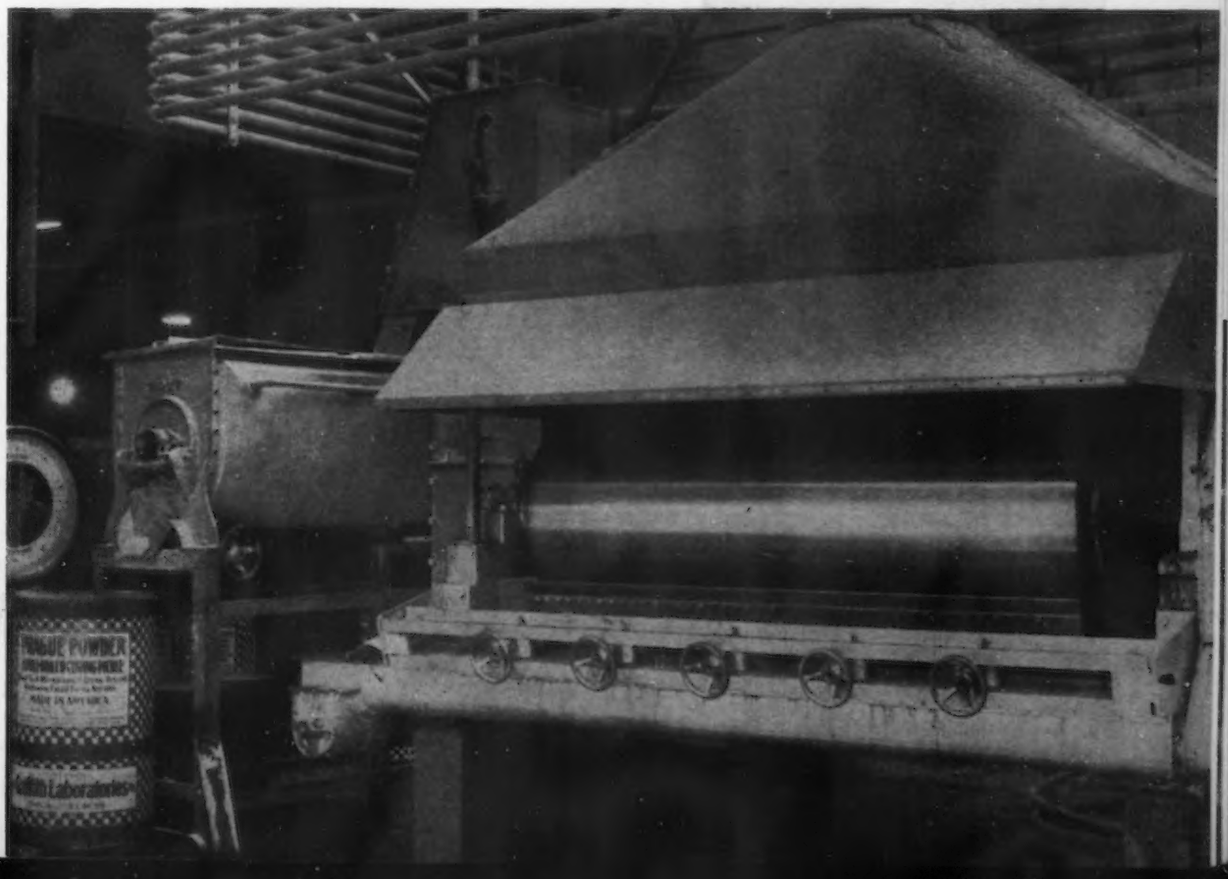
Effectiveness of Finishes for Industrial Instruments

Functional Aid	Durability	Reasonable Cost	Attractive Appearance
Protection from rust, the only requirement, varies with durability.	Organic coats	Chemical rustproofs	Electroplates
	Paints	Paints	Organic coats
	Electroplates	Hot-dip coats	Paints
	Hot-dip coats	Organic coats	Chemical rustproofs
	Chemical rustproofs	Electroplates	Hot-dip coats

Examination of Table V shows that paints, organic coatings and electroplates are the most likely to be chosen. Most instruments of this type are finished in paint, lacquer enamel or pigmented synthetic, often in plain black or in wrinkle finish, with plated trim. The name plates, of course, are finished in the usual fashion by etching, plating and covering with a clear lacquer.

Finish As Functional Aid

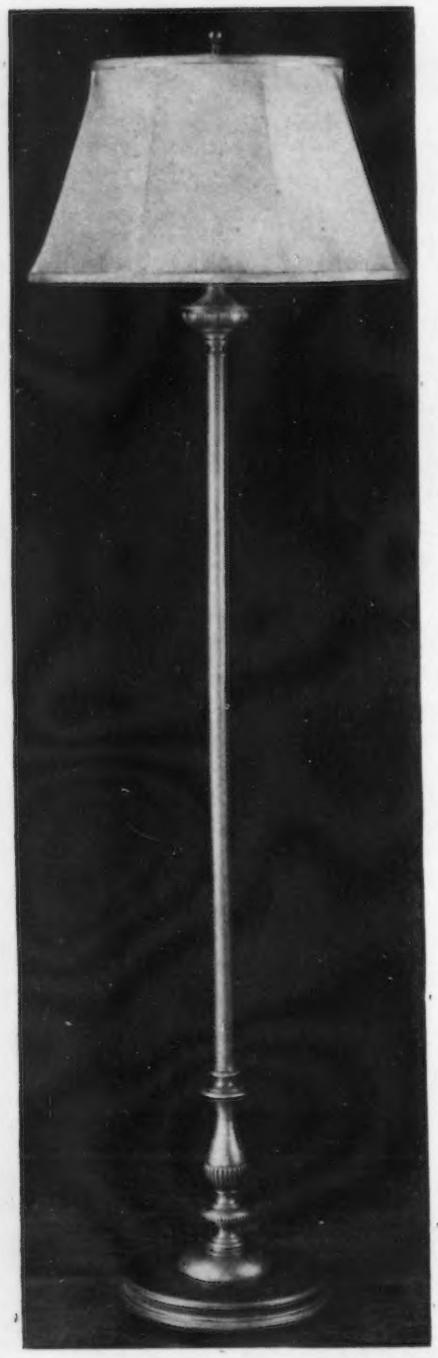
Since none of the examples cited above have illustrated the functional aid or improvement in operating characteristics which might be imparted by a finish, it is in order to point here to the use of heavy chromium deposits, of machine parts subject to heavy



o o o

PLATING for functional purposes. Industrial chromium plate is used here on a chemical drying drum. Photo from Chromium Corp. of America, Waterbury, Conn.

o o o



THIS is a finish designed mainly for decoration. A combination of electroplating, chemical coloring and lacquering is used. Photo from Lightolier Co., New York.

o o o

wear and corrosion, like pump shafts, washers and plungers in Caterpillar tractors.[2] Here the finish plays a most important part in the functioning of the machine; it must be durable, its first cost is unimportant because of its savings in machine wear, and its appearance is of no moment whatsoever. Only a glance at the list of finishes is required to see that chromium plate is the only one to choose for this purpose.

Another outstanding example of the use of finishes as functional aids is the use of clad metals for resistance to very severe corrosive or wear conditions, especially for plant equipment where the first cost is of secondary importance, the overall cost being reduced by the lengthened life.

Still another interesting functional aid is aluminum paint which, when applied to the outside of furnaces, reduces the heat radiation and improves the operating efficiency of the furnaces; and also on roofs of buildings to reduce the heat conducted into the building from the sun.

A very recent example of the use of a finish for functional purposes is the gold plated drying and heating reflector used by Ford and made by the G. M. Hall Lamp Co. The gold plate, it is stated, has such a high efficiency for reflecting infra red radiant heat that, in use for baking synthetic enamels it reduces the time of drying by 85 to 90 per cent. Here is a case of an industrial accessory in which the (first) cost has very little bearing on salability.

Conclusion

Limitations of space of course prohibit illustrations of analyses for all of the finishes available. It is believed, however, that the method of selection outlined in the choice of metal finishes is applicable to almost any problem.

To set up a perfect and all-inclusive standard procedure for choosing the "right" finish for any and all products is clearly impossible. The multitude of products, the infinite variety of designs and the number of processes and materials available for finishing, make it necessary to keep any plan or schedule extremely flexible in character. No rule can be written which will not have a number of exceptions.

Nevertheless, every problem is bounded by certain fundamental considerations. An analytical approach and an orderly, perhaps at first even elementary, procedure will often keep the manufacturer from overlooking or omitting possibilities, and may suggest finishes which will improve the appearance, add to the life, decrease the cost or improve the functioning of his product to an important extent.

o o o

A DRASTIC change in lawn mower construction and finishing. Electroplate and baked enamel are used on steel and die castings.

o o o

[2] See THE IRON AGE, May 18, 1939, p. 76.

COPPER WIRE ANNEALED AND TINNED IN STRANDS

THE bright annealing and tinning of copper wire continuously in strands has been made practical through a new joint development by the Syncro Machine Co., New York, and the Surface Combustion Corp., Toledo, Ohio.

Referring to the accompanying illustration, the wire is unwound from the spool at the right, passes over a push-pull capstan, through a mechanical cleaner, and then through the annealing chamber. For tinning, the wire then passes through a chlorine fluxing agent. Fluid tin is uniformly applied under pressure by means of a unique construction of jets. The tin is entirely enclosed, reducing oxidation losses to an absolute minimum. Excess tin is retrieved and the wire burnished to a high luster as it leaves the tinning zone, by a self-cleaning wiping device.

Quenching takes place in circulating water, the excess water being removed by a highly efficient vacuum wiper. The wire then passes through a visual indicator which constantly shows and controls the degree of anneal. This device makes possible extremely accurate and uniform control in obtaining the desired percentage of elongation.

The take-up is motor driven and provided with a traverse. The spool drive automatically maintains correct tension throughout the filling of a spool. The spooling tension can be adjusted while the unit is in operation.

The unit can be used for either tinning or straight bright annealing. The annealing chamber consists merely of special open flame burner with a sheet metal hood as a protection against drafts.

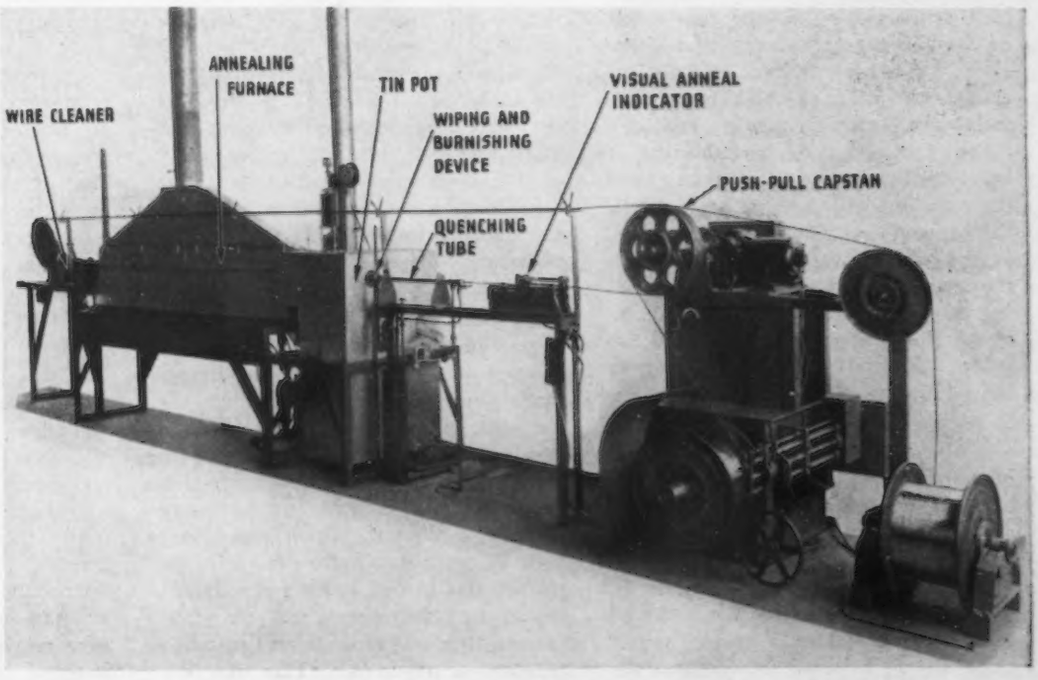
The flame is continuous and up to 27 ft. long depending on the gage of the wire. The burner is specially constructed to produce a flame of uniform height along its entire length. The wire is carefully guided through the reducing portion of the flame so as to eliminate oxidation. This principle of bright annealing is the same as used on the large continuous direct-fired furnaces for annealing wire in coils and in which the burners are set slightly rich so as to produce a reducing atmosphere.

The elimination of an expensive furnace and other contributing factors is said to make this method of annealing or annealing and tinning copper wire, drastically cheaper than any other method.

o o o

SINGLE strand machine used for bright annealing or annealing and tinning of copper wire. The standard unit is a six-strand machine.

o o o



Throw Away the

° ° °

IN one cold drawing shop recently a shape, like the one shown at A in Fig. 12, caused no end of trouble in attempting to draw and hold to specifications. The steel being drawn was a tough, dense tool steel that was impossible to anneal below approximately Rockwell B-90. The specifications called for a diameter of 0.499 in. plus or minus 0.001 in.

The angle shown at B was 90 deg., minus nothing plus 5 min. The complete angle was below the center line of the shape, which fact was responsible for most of the trouble encountered, both in the building of dies, and, by its location, causing a tendency for the free end of the bar while drawing to assume a spiral motion. Thus there was created extreme heat in both the bar and die. One leg of the angle, as shown at C, was located directly on the center line of the shape, there being a variation allowed of 0.001 in. above the center line and 0.0007 in. below. Special stress was placed on the requirements that all corners were to be sharp and free from scratches.

A hardened, ground and lapped gage made within the tolerances allowed was furnished by the customer and any bar not fitting this gage tight was rejected. This situation necessitated drawing the bars in lengths of approximately 3 ft. to avoid excessive stretching, which would affect the fit between the bar and the gage. The difficulties encountered in drawing this shape were very similar to those in the shape previously described (last week) and in many respects were more serious. The shape, being of relatively small diameter and made of a steel very difficult to handle, had potentially apparently unlimited eccentricities.

After the break-down, which left 0.020 in. draft for finish-drawing, an attempt was made to draw the shape in a center bearing solid die. (See issue of Aug. 3.) The first few bars were within the desired limits and had all the appearances of a perfect job. Just about the time everything appeared solved, things commenced to happen. After drawing 10 perfect bars, the next bar started to scratch at the junction of the angle and the radius and before the bar machine could be stopped the bar was badly ripped. An examination showed the die to be badly "ringed," and one of the small projections forming the angle was badly torn, extending nearly to the size point of the die. The "ring" was removed. and in repairing the damage to the projection it was necessary to shorten it considerably in length.

By changing the length of this one projection the die was thrown out of balance—that is, the bar no longer made even contact with the drawing surfaces in the throat of the die, the result being that the next bar drawn was so badly twisted it resembled a cork-screw. Thus it became necessary to reverse the die, which was done; then 19 more bars were drawn before the die was ruined by both projections being practically ripped out. A duplicate of the die was made and so-called production resumed. This die delivered 40 bars before being ruined beyond repair, and this number of bars was made possible only by constant attention on the part of the die maker, by removing the "ring" formed after every two or three bars.

Finally, the only thing to show for three weeks labor in the cold drawing department were two ruined dies and 69 bars of steel weighing approximately 138 lb., to be applied against an order of 5000 lb. This trouble proved to be only the beginning. Nearly four months were spent trying every conceivable surface and coating on the bars, in an endeavor to develop a surface condition conducive to longer die life. Some improvement was made in this direction but not enough to offset the failure of the die-makers, who during this time had tried every known style of solid and sectional dies without success, and in desperation were trying any and everything that even remotely resembled a die. But no matter what the die, the ever present "ring" was to be found at the base of the angle projection, and always the problem remained the same —by repeatedly removing the ring the die would be either thrown out of balance, or rendered short lived; if the "ring" was not removed the projections would be ripped from the die.

It was then decided to depart entirely from the accepted standards of cold drawing. Casting around for ideas, the construction of a series of very small thread-rolling dies for the typewriter industry was recalled. While these dies embraced no cold drawing principles, nevertheless they did produce a beautiful 60-deg. angle accurate to 0.0002 in.—and angles were responsible for the present difficulties. This line of thought led

SCRAP BARREL

By S. A. MOHT

directly to the turks-head die sometimes used for cold rolling shapes. A ray of hope was seen, and it became a simple matter to combine the principle of the turks-head die with the cold drawing die—thus a new-type die, shown in Fig. 12, was born.

The top and bottom dies, D and E in Fig. 12, differed from the sectional dies previously described (last week), in the respect that the surfaces that would normally support the concave and convex radius were ground flat. The hardened and ground dowel pins F, which also served as an axis for the 90-deg. angle roller-dies G to turn on, were used as a means of keeping the dies in proper relation with one another. After the dies had been squared up, they were strapped together and the dowel pin holes bored in their proper pre-determined location. Next, two temporary dowel pins were placed in the holes just bored; and, placing a shim of the proper thickness between the dies to permit a grinding of the dies after hardening, the 0.499 in. hole was bored, leaving 0.010 in. of stock for grinding purposes, accurately located between the two dies and in the correct position in relation to the center distance between the dowel pins.

After hardening the dies, a light grinding cut was made across the surface of each die to provide parallel surfaces, and the dowel pin holes were lapped smooth both to the same size and pins fitted to them. Then, reassembling the dies, the throat and drawing surfaces of the hole were ground and polished to the proper drawing size. After this operation, the bottom of die E was ground until the absolute center line of the hole was reached, completing dies D and E. The amount of stock removed by this grinding was added to the thickness of the shims that had been used throughout the construction of the dies, and new hardened and ground shims shown at H were made to this new measurement. The 90-deg. angle rollers G were hardened and ground all over to the correct dimensions, leaving 0.0007 in. clearance between the dies and the rollers after the shims H were in place and the die assembled in a die frame such as previously described (last week).

THE design and construction of sectional dies for cold drawing of steel were described in detail last week. Herein, in the second and last section of this article, the author continues with detail on a new type of break-down die, and includes data on coatings for drawing and other elements in the preparation of steel for drawing.

This die proved a success from the outset, the shape drawn having clean sharp corners and showing a perfect fit in the gage, with no sign of a twist. Friction was practically eliminated, which fact allowed speeding the job. Furthermore, the length of the bars being drawn was increased to 7 ft. without any harmful results. In less than a week, as far as the cold drawing department was concerned, the job was completed. Not once was the die removed from the bar machine.

New Type of Die

Not long ago there was introduced by a die maker, without doubt one of the best in the industry, a new method of constructing solid break-down dies that is simplicity itself and positively eliminates any possibility of the bars being drawn with high-corners in either the break-down or finish-draw. If ever a costly, patience-exhausting problem of long standing was neatly solved, this was it.

In describing this new construction, the writer will use as an example the hexagon center bearing die (see article in Aug. 3 issue), which is shown in Fig. 13 as a broken section of a die containing the throat and bearing surfaces to be used in breaking-down bars to finish draw 1 in. in diameter. When making this type of die, the die maker proceeds as previously described in making the regular center bearing die (see Aug. 3 issue) up to the point where the die is ready to harden. After the die is hardened, the die maker will use two different types of files, in bringing the die to size, a No. 2 cut square file, smooth on two sides for working-in the corners and a No. 2 cut pillar file with smooth edges. On each of these files, by means of an oil stone, the die maker stones the four edges of each file, forming a slight radius which prevents the file from cutting sharp corners when coming in contact with the surfaces on either side of the surface being filed, thus leaving a slight radius between the connecting faces of the angles. This radius is shown greatly exaggerated at B in Fig. 13.

Using the files just stoned, the die

maker proceeds as formerly to bring his die to the proper size, with this difference—instead of filing the die to the size to which it was formerly filed, the die for this particular size bar is filed 0.006 in. smaller in diameter. After the die has been filed to this new size, the drawing surfaces of the die are covered with blue vitriol to be used as a guide in keeping the radius about to be filed centrally located between the adjoining faces of the angles. Then, by using the same files, a radius is filed from corner to corner on one drawing surface of the die, which for this size die should not exceed 0.003 in. in depth at the center, as shown greatly exaggerated at A in Fig. 13. This operation is repeated on the next two adjoining surfaces, which leaves three drawing surfaces of the die straight from corner to corner, and three having concave radii; then, by repeating the operation on the three straight surfaces, the die is completed.

Thus, this die will draw a bar having, instead of flat surfaces, surfaces that are slightly rounded, being of the correct diameter at the highest point, the center of the bar, and gradually reducing in size until terminating at the small radii forming the junction points with the adjoining angles. At this point the bar will measure 0.006 in. smaller in diameter than the diameter at the center of the bar. This being the case, the bar has a diameter across the highest points of the radial surfaces corresponding to the former correct break-down diameter for a bar of this size, while the diameters of the surfaces at the rounded corners are 0.006 in. undersize. There are definite limits which must be observed in forming the radius B in the corners and decreasing the diameter of the surfaces at these corners. If these limits are exceeded, it will be found when finish-drawing that the corners of the bar will not fill out nor will the surfaces of the bar be straight across. The following decreased die sizes based on a 0.025 in. to 0.030 in. draft have proved, when not exceeded, to form perfect flat surfaces and clear sharp corners:

Diameter of Bar	Die Under Size at Corners
0.187 to 0.375 in.	0.002 in.
0.375 to 0.500 in.	0.004 in.
0.500 to 0.875 in.	0.005 in.
0.875 to 1.500 in.	0.006 in.
1.500 to 2.500 in.	0.007 in.
2.500 to 3.000 in.	0.008 in.

In forming the radius B in the corners of the die, the die maker will have to depend upon his own judgment and experience. The writer has made it a practice when making these dies to form a very slight radius in the smaller size dies and gradually increase the size of the radius as the die size increases, to about 1/64 in. in a die 3 in. in diameter. This type of break-down die has been used in drawing thousands of bars of steel of all grades and hardnesses possible to cold draw, with never a high corner appearing on the bars after the break-down, or on bars that have been finish-drawn after being broken-down by one of these dies. Not only are these dies responsible for fine looking bars, but by eliminating high corners from the bar the life of the finish-die is measurably increased. Bars drawn through this type of die, then finish-drawn in a sectional die, make a combination impossible to beat. The only dies the writer has ever seen surpassing this combination for economical results is an entirely new type of die not yet introduced to the industry. This die, when it is introduced, will quite likely be responsible for radical changes in many cold drawing shops.

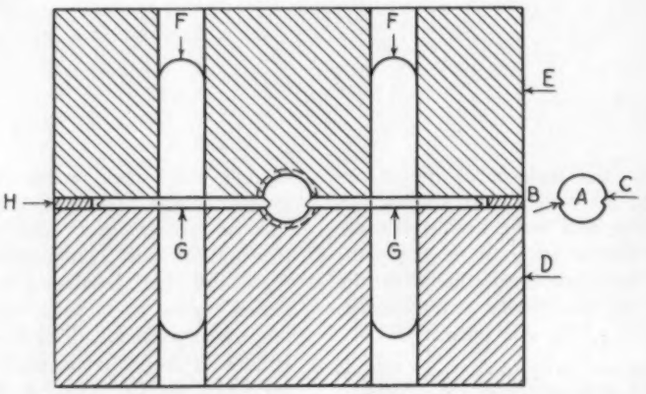


FIG. 12—A difficult shape to draw is shown at the left. This turks-head die was developed to draw this shape when other designs of dies failed.

Processing of Steel

Every foreman of the various departments (particularly the annealing room), who is responsible for the processing of steel preparatory to cold drawing, should be required to serve an apprenticeship in the cold drawing department. There he would gain first-hand knowledge of the needless difficulties other departments are directly responsible for and be familiarized with the appalling amount of damage and waste caused by attempting to draw steel improperly processed for cold drawing. Perhaps then the not infrequent practice of trying to "slip over a fast one" would be discontinued. But it may be futile to comment on the importance of cooperation between various mill departments. The lack of such cooperation is so familiar to everyone working in the mill that it is accepted as a matter of course even though it is a constant source of irritation to everyone. Without question the great majority of steel reaching the cold drawing department in a poor condition is not due to lack of knowledge on the part of the various department heads of the requirements necessary to the efficient operation of the cold drawing department. But, there is a familiar game called "passing the buck" which often goes under the alias of "cutting corners."

Here is a typical example of "cutting corners." One mill recently had a job involving a 25-ft. hexagon bar of chrome-molybdenum steel, heat-treated (one of the most disagreeable steels to cold draw), 3.000 in. in diameter plus 000 minus 0.005 in., having a Brinell hardness of 280 to 310. As usual it was a hurry-up job. The bar was hammered to shape, and instead of the bar receiving an anneal to normalize the strains set up in the bar by hammering, the bar was sent to the pointing hammer where one end of the bar is heated to forging temperature and reduced in size to allow the bar to enter the break-down die. After such an operation steel is always annealed to give uniform hardness. But, there was no time for this if the department schedule was to be maintained. It was necessary to "cut corners" so this anneal was eliminated and the bar was sand-blasted, pickled, coated and made ready to cold draw.

In the meantime the die maker, who had spent nearly two weeks making the break-down die, being very familiar with the results of "cutting corners"

was watching events closely. When the bar reached the cold drawing department the die maker raised violent objections against even attempting drawing the bar, but to no avail. The operation sheet accompanying the bar showed all necessary operations preparatory to cold drawing completed. The die maker pointed out that from the time the bar was hammered to its delivery in the cold drawing department the elapsed time was far short of the time needed to complete these operations. All this was unimportant —here was a bar of steel nicely coated ready to draw and badly needed to complete a shipment. The job was started. The bar had just started to draw when hard surfaces on the bar were encountered and with a roar the die split in half, and with the die went all visions of any immediate shipment.

So far, 16 hr. saved by "cutting corners" resulted in 8 days' delay, the time necessary to build a new die. During these 8 days, instead of annealing the bar, the pointed end of the bar back for a distance of approximately 1 ft. was ground to about the size of the hole in the break-down die in an effort to avoid any further hard spots or surfaces, after which the bar was re-coated. In the next attempt the bar was successfully broken-down, but in so doing the die was rendered unfit for further use. Next, the bar was sent to the heat-treating department, and, after treatment and recoating, the bar was successfully drawn-finish. Disregarding the two dies ruined, it was "pointed out" to the die maker that it is not always necessary to anneal steel. The bar was badly "bowed" in finish-drawing, and even though the bar had been heat-treated and tempered and drawn well within the hardness range the strains set up by hammering were still present; for, in attempting to straighten the bar on the bull-dozer, the straightening arm had no sooner exerted pressure than the bar snapped in three pieces.

A catastrophe of this extent was sufficient to raise some eyebrows in the front office, but they were quickly lowered by the explanation that the departments responsible were endeavoring to "cut corners" in attempting to complete a shipment. Naturally, it was impossible to severely criticize so commendable an effort that failed due to a "little hard luck." Nevertheless, the raised eyebrows were remembered; for five weeks later the cold drawing department received another bar of steel *fully annealed* to replace the one scrapped, which was drawn quickly and accurately and *only* seven weeks late.

It is impossible to prescribe any hard and fast rule to govern the processing of steel preparatory to cold drawing without imposing restrictions that would seriously interfere with production. This fact is why it is so necessary that those in the cold drawing department know when an operation can be safely eliminated or, when some uncalled for operation must be added. A procedure that would prove a howling success in one instance when tried again will prove a dismal failure, and especially is this true when working within small tolerances with steel of high Brinell hardness. It is this ever-present element of suspense and the challenge flung in the face of everyone by each bar of steel to be cold drawn, daring them to match their skill against the obstinacy of the steel itself in resisting any change of shape and character, that makes the cold drawing of steel one of the most fascinating branches of the industry. The complete lack of repetition, due to the fact that each job presents its own individual problems, prevents the application of mass solution.

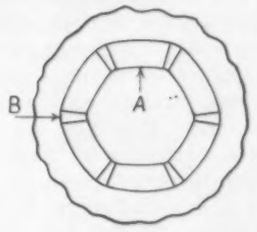


FIG. 13—Throat and bearing surfaces of a solid break-down die, which eliminates the possibility of high-corners in either the break-down or finish-draw.

Certain cold drawing shops are negligent in training men to recognize these facts. This lack of training can be nicely illustrated by the following occurrence. A large order of heat-treated hexagon bars of small diameter were being drawn-finish. When the order was about half completed, for no apparent reason a distinct twist developed in the bar. It was a condition sometimes encountered in heat-treated bars due to internal strains being set up in the steel, in some as yet unexplained way, by the heat-treating process. As far as the cold drawing department was concerned the remaining bars, as yet undrawn, were scrap, so the die maker having charge of the job stopped production.

When this report reached the superintendent, he decided it was about time the cold drawing department was "straightened out." Who ever heard of strains caused by heat-treating? The dies were examined for twist and were cleared of blame. The bars not yet drawn-finished were examined to determine if they had been twisted in the break-down draw, and they also were found to be satisfactory. After every possible check had been made, the fact remained that bars which were apparently perfect were being drawn through perfect dies only to result in twisted bars. That was too much for the superintendent so he retired to think the situation over. While this thinking process was going on, the die maker quietly had 25 bars annealed and then re-heat-treated. On their return, five of these bars were drawn-finish and each was perfectly straight. The result of this experiment was passed on to headquarters and orders were received to draw the remaining 20 bars. And, when these 20 bars drew straight, it was obvious that the cause of the trouble lay (as diagnosed) somewhere in the heat-treating process.

However, the superintendent in the meantime had decided that there was nothing that could be done by re-processing that would save the bars. If they were to be saved, the cold drawing department must do the saving. In all seriousness the superintendent ordered the die maker to file a die having a twist opposite to the twist in the bar and carefully explained how one twist would offset the other, resulting in perfectly straight bars. It was pointed out that a hexagon had six sides and there was no way of determining from which of these sides the twist would start, thus making it impossible for the bar machine helper to insert the right side of the bar in the right place in the die to produce the desired results, even if it were possible to make such a die. The only retort was "what in hell kind of die makers were working in the cold drawing department?" The only thing unusual about this instance is that, fortunately, the heat-treat is rarely guilty of being the cause of twisted bars—the writer has seen just three cases in the past five years.

Use of Lubricant

In cold drawing steel, probably the most vital factor to be considered is the lubricant used. The writer has

probably tried every drawing agency on the market recommended for cold drawing steel, including liquids, semi-solids and metal coatings to be used without or as a lubricant, and as yet nothing has been found that can approach the efficiency of powdered or flake soap. Of all the soaps offered for this purpose none is better than the product of Procter & Gamble. This statement is conscientiously made after watching this soap time after time successfully compete with other soaps, this being especially true when drawing non-corrosive steel.

Probably next in importance is the coating given the bar which acts also as a lubricant. For the general run of all heat-treat steels, both before and after heat-treating, and the various tool steels, a plain water-lime coating is generally used. This, to give the best results, should be allowed to season until the bars have thoroughly cooled and assumed a pronounced rust color. The practice of trying to draw steel when the coating is "green" is responsible for a great many cases of unsolved die trouble. While this is the cheapest coating to apply, the writer seriously doubts when considering die cost that it proves the most economical in the long run. There are times when, due to some undetermined surface condition, it is practically impossible to draw steel thus coated without ruining dies faster than they can be built. And, in such cases there is just one remedy if the steel can be drawn at all, and that is copper plating, which in the opinion of the writer is the only coating that should ever be put on steel to be cold drawn. There is an exception of course in the case of steel requiring a bright finish, which is produced by using a white-lime coat; but, due to its poor lubricating qualities, such coated steel is as a rule troublesome to draw.

There seems to be a marked reluctance on the part of some steel manufacturers to have it generally known that copper plating is used as a medium for cold drawing steel, and great care is taken in removing all traces of copper from the steel before shipment. Regardless of all arguments to the contrary, the writer is of the opinion that if the cost of coating steel with copper was considered in its entirety with the cost of other coatings instead of comparing the cost of a pound of copper sulphate with a pound of lime, the saving in die cost alone would more than offset any added cost resulting from using the copper coating exclusively. Dies drawing copper coated bars will, other conditions being equal, outwear dies drawing water-lime coated bars two to one. Then again, copper coated bars can be drawn at a faster speed. The superiority of copper coating over other coatings is proved by the fact that it is the only coating that can be applied to high speed steel and some non-corrosive steels and produce consistent results. In fact some non-corrosive steel can be drawn with no other coating but copper.

Previously stressed has been the importance of having steel properly annealed before attempting cold drawing. But, there is another serious condition which the cold drawing department must constantly contend with. In drawing bars within a certain Brinell hardness range that are not heat-treated, it is often possible to draw the bar through the break-down die then, by taking a Brinell reading from the bar, determine if the bar can be drawn-finish without annealing and still remain in the hardness range desired. And, often the Brinell reading will indicate that it will be possible to eliminate the anneal between drafts and proceed to draw-finish.

But, quite often the Brinell or Rockwell reading is very misleading due to the fact such readings give absolutely no information as to the hardness of the immediate surface of the steel under test. That is, when a bar has been drawn through the break-down die, the grain of the steel at the surfaces of the bar is refined to a greater degree than the grain of the steel at the depth which the hardness readings are taken, which may or may not cause a hard smooth surface on the bar extending to a depth of, as far as the writer has been able to determine, 0.005 in. (The writer has been experimenting for the past two years with an instrument for checking this surface condition and has reached the stage where it is possible to make readings to a depth of 0.005 in. To find the ultimate depth of this extra hardness will require additional investigation which the writer hopes to complete soon.) This hard surface, due to the failure to recognize the condition, is responsible for hundreds of dollars worth of ruined dies yearly. Steel to be successfully cold drawn should have an open grain surface which will leave a feeling of roughness when handled. This, of course, does not mean a ragged, scale pitted surface. Bars having a hard surface will as a rule scratch badly and often ruin the die. When this trouble is encountered the bars may be given a light anneal of about 400 deg. for approximately 2 hr., which has no effect on the Brinell hardness, and it will be found that the grain of the steel has been opened up enough to produce the desired roughness which will prevent any further trouble when drawing-finish after the bars have been re-coated.

There are two other departments directly affecting production and the cost of operating the cold drawing department that are often prone to cut corners. These are the pickling and sand-blast departments. The pickling department, when working under pressure, has a great habit of pickling steel about half clean and then applying a beautiful coating to hide what remains on the steel. But, the experienced die maker has learned that if the coating is lightly scraped from the steel and the place scraped rubbed with his fingers, they will have the appearance of being rubbed over carbon paper of the steel is dirty, while if the steel is clean they will have just a dusty appearance. Dirty steel being practically impossible to cold draw, the customary argument takes place, after which the steel is either re-pickled, or if the lot involved is small an attempt is made to "try and get it through." This feat if accomplished is generally done at the cost of a ruined die.

The sand-blast department sometimes follows a false course of economy by using both sand and shot over and over again until they have lost all usefulness for the purpose for which they were intended. After the grains of sand have lost their sharpness they are useless as a cleaning agent, and, when used after reaching this stage, instead of the sand cutting as it should it polishes over the dirt. While the steel may have all the appearance of being clean, a little finger-rubbing will reveal its true condition. In the matter of shot, the results are much more serious. Shot when used too long will break into minute particles which become embedded in the steel, and each of these particles means a scratch on both the die and the steel being drawn. These particles, being of practically diamond hardness, will cut any die to pieces, including Carboloy dies. Men sometimes work for days on shape-bars, carefully examining every inch of the bars and removing any particles found by using a hardened pick or small hammer and cold-chisel. There is no other way to get rid of them once they are embedded in the bar, and if their numbers are too great a large percentage of the bars will be scrapped.

KENNAMETAL

A NEW CUTTING ALLOY

MANY users of cutting tools are always on the lookout for a carbide tool metal capable of machining steels of all hardnesses with practical economy. These two important attributes are claimed by the makers of Kennametal, a hard alloy made by processes of powder metallurgy in vacuum furnaces, with the new intermetallic compound $WTiC_2$ as the essential ingredient.

The new ingredient, $WTiC_2$, is a substance synthesized from tungsten, titanium and carbon under certain conditions, and contains one atom of tungsten, one atom of titanium and two atoms of carbon in a single crystalline form, possessing distinctive physical and chemical properties. It is said that this compound is not subject to grain growth of any moment, thus making possible the production of finer-grained, dense, strong tool metal having high hardness, namely 78 Rockwell C, as compared to 66 Rockwell C for hardened high-speed steel. In fact, with rigid lathe conditions, it is said that bars of hardened high-speed steel at 65 Rockwell C have been machined with the new tools, producing small-coiled turnings.

However, the chief use of the new series of hard metal alloys, known as Kennametal, is for tipping metal-cutting tools for turning, facing, boring, milling and reaming steel of hardness ranging from 200 to 500 Brinell. Speeds of cutting from two to six times as great as with tools of high-speed steel are claimed, the depth of cut and feed being regulated by the capacity of the machine to carry the load. Surface finish at these speeds is smoother, because of less "galling," or "built up edge" in cutting. Often grinding may be dispensed with; that is, the hardened stock or forging may be machined without annealing. In other cases the grinding operation is said to be much lighter and therefore at lower cost, because of the more accurate machine finish. Tool life between grindings of 5 to 20 times that of steel tools is claimed, depending on machining conditions and types of steel being machined.

Special tool angles, and chip curlers or breakers are ground on the Kennametal tools, and tool designs for these are available in charts furnished by the McKenna Metals Co., Latrobe, Pa., maker of Kennametal. The product may be obtained as tips, known as "tool blanks," to be brazed by the user, or as complete tools with charges depending upon the degree of finish and tolerances required. The tools are said to take "jump" or interrupted cuts when designed with proper shear angles described in the charts and in the tool catalogue.

Grinding of these tools is done with special loose bonded grinding wheels of silicon carbide, or more preferably with diamond impregnated bakelite wheels. The silicon carbide grinding wheels do not really cut the hard particles of $WTiC_2$, but do remove the binder, which in turn releases the $WTiC_2$. The diamonds actually cut the whole composition. Hence diamond grinding is more rapid and does not build up sufficient heat to cause cracking, which may be the case if the silicon carbide wheels become glazed. Also, wheel wear with the diamond wheels is insignificant, some of those in daily use having lasted over a year.

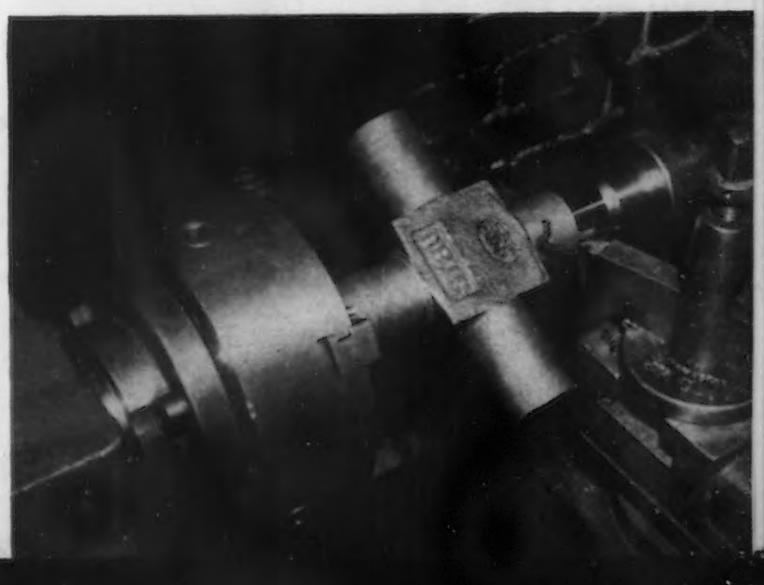
It is stated that these new steel-cutting carbide tools are being employed in machining gear blanks of nickel alloy steels; turning automotive axles in the heat-treated condition; machining projectiles of SAE 1045 heat treated steel; roughing and accurately finishing stainless steel cylinders; turning cast steel truck wheels; machining oil well joints and pipe; making road building equipment; turning motor shafts, and silicon laminated motor cores; and in cutting special alloys such as Hadfield's manganese steels and hardenable Monel metal.

TOOL with chip curler cut the chips shown, at 213 ft. per min. and 0.024 in. feed and 3/16 in. depth of cut, from SAE 1045 steel projectile forgings.

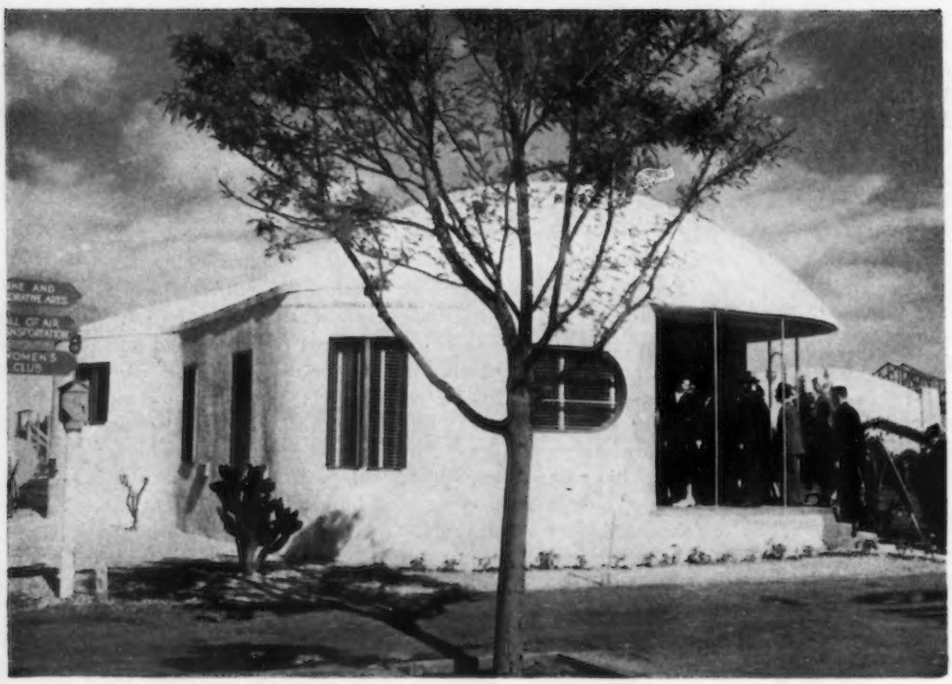
o o o

THIS Kennametal tool is turning Hadfield manganese steels (12 per cent manganese) at 100 ft. per min.

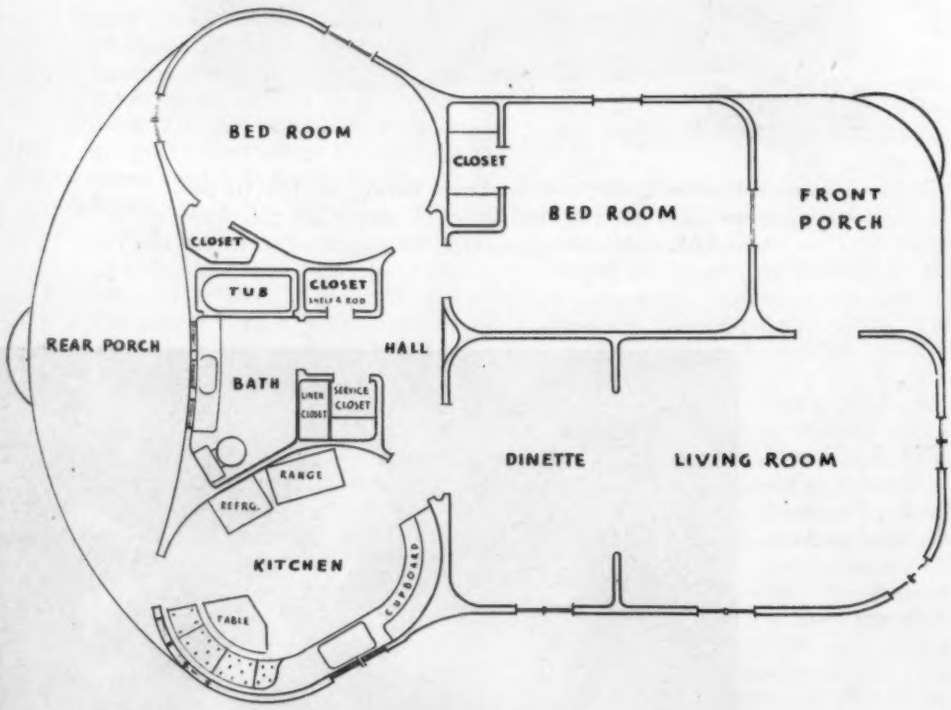
o o o



CALIFORNIA BUILDS S



COMPTON steel home. Crowds inspect this type of house, above; floor plan, below, shows absence of corners.



AFTER years of experimental designs in metal houses, California has adopted the all-steel frame house. Many homes of this type are being constructed in the state, particularly in the residential areas of San Francisco and Los Angeles.

Due to attempts to use sheet steel in wall construction early experiments in steel homes were discouraging. Hot days and quick-cooling nights in many sections of California caused rapid expansion and contraction of the metal, resulting in buckling and crackling noises. Also, these walls failed to afford adequate heat and sound insulation.

The new type of steel house employs double plaster and stucco walls with a dead air space for heat and sound insulation. Framework is entirely of steel — steel floor joists, studs, lath, sills and roof trusses. Floor and roof surfacing is of various materials, although in many cases concrete or other non-combustible material is used, making an entirely fireproof structure.

Two of the most successful designs now being constructed are the Compton steel home and the Soulé steel house (see illustrations). Both of these structures can be built without the use of a single piece of wood. Actually, however, there are many variations in the use of materials.

Although the initial cost of these homes range from 6 to 12 per cent higher than the same lay-out in wood frame construction, the steel frame dwellings are being found economical as well as practical. Low insurance rates and low maintenance costs more than compensate for the differential. These houses also show remarkably slow depreciation, being practically indestructible by time, fire, flood, earthquake or termites.

Although unique in appearance as well as construction, the Compton home was designed for practicability rather than for any unusual architectural effect. Oval rooms and all rounded corners completely eliminate right-angle dust traps and allow a freer

STEEL HOMES

By CHARLES F. BERRY

circulation of air. Even closet and hallway corners are rounded.

As originally designed, the Compton house has not a piece of wood nor any combustible material in its entire construction. Floors are of suspended concrete; walls are of stucco over metal lath welded to steel studs; roof trusses are of steel; and roofing is of a light pumiceous concrete. All doors in this absolutely fireproof structure are of steel. Shelvings, moldings, mantles, cabinets and all interior trim also are of steel.

Neither bolt nor screw is used in construction of the Compton home, all structural joints being arc welded. Two rows of flexible steel studs for the double walls are welded to flatbars nailed directly to the soft pumiceous concrete floor. For the small five-room dwelling a total of 300 studs of 1¼ x 1¼ x ¼ are required for the two walls. Windows are all of a multiple of 16-in., the distance between studs, and may be rearranged at will during framing without changes in the builders plans. The steel window frames are welded directly to the studs, and the studs are tied together by pieces of welded 1-in. flat bar.

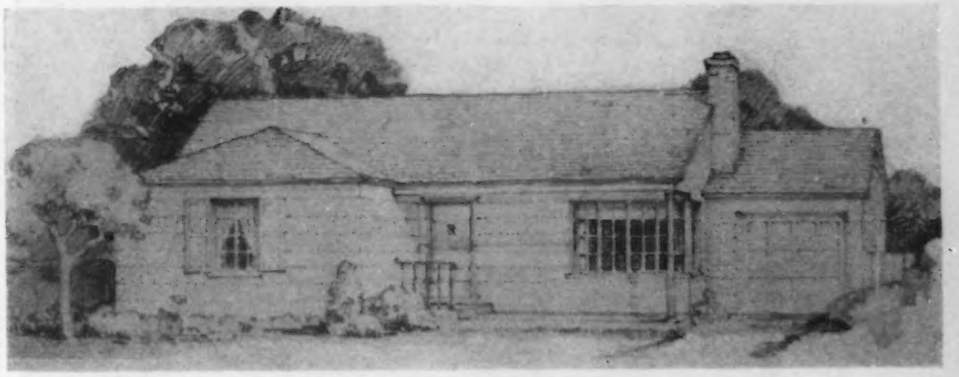
Steel bowstring trusses, the cord of angle iron and the arc of T rail are used for the roof structure. One-in. angle iron is welded to the cord of the arc for the secondary member. Twenty trusses for the five-room house, varying in span from 18-ft. 6-in. to 35-ft. 3-in., are cold formed on the job. The roof is formed by Gunited pumiceous, cement over metal lath, the cord of the truss serving as the ceiling joist. The truss is designed to carry a load of 80 lb. per sq. ft. without any partition support. The streamlining of the building is accomplished by the different height of the trusses, higher in front and tapering off in the rear. For exterior trim effect, copper shingles may be nailed directly to the cement roof.

All steel is of standard sizes and may be purchased anywhere. Welding starts as soon as the floor is set and continues without interruption until framework is complete. Approximately one ton of steel per room is required.

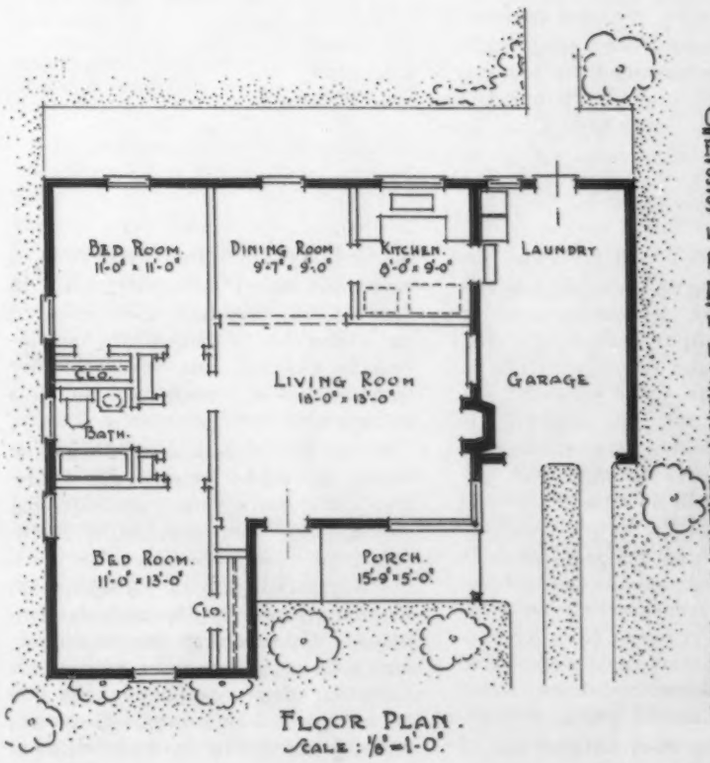
Cost of the standard five-room house is approximately $1000 per room, of which nearly 70 per cent is for materials.

The Soulé steel frame house is also finding ready popularity . Six small residences of this design are under construction in San Mateo, suburb of San Francisco, and five more in the adjoining town of San Bruno. Many others are under construction or have

(CONCLUDED ON PAGE 102)



UNI-BILT steel frame home, plan A-2-R, of Soulé Steel Co., San Francisco.



FLOOR PLAN.
SCALE: ⅛"=1'-0"

CONSTRUCTION OUTLINE

FOUNDATION: REINFORCED CONCRETE
STRUCTURE: SOULÉ UNI-BILT STEEL FRAMING FOR EXTERIOR AND LOAD BEARING WALLS. STEEL ROOF TRUSSES AND FLOOR JOISTS.
EXTERIOR WALL FINISH: REDWOOD SIDING WITH HEAVY BUILDING PAPER BACKING.
INTERIOR: HARDWALL PLASTER
FLOORS: OAK, LINOLEUM, TILE.
WINDOWS: SOULÉ STEEL CASEMENTS WITH SCREENS
PORCH: CONCRETE FLOOR.
ROOF: REDWOOD SHINGLES.
HEATING: GAS-DUAL WALL FURNACE.

FLOOR AREA - 965 SQ.FT.
GARAGE AREA - 214 SQ.FT.
PORCH AREA - 79 SQ.FT
TOTAL COVERAGE-1258 SQ.FT.

" . . . in job rating, the work performed in each job is carefully studied, and specifications are drawn up listing the requirements in the way of education, working conditions, etc." Photo courtesy Ohio Electric Mfg. Co.

o o o

By EUGENE CALDWELL
Consulting Management Engineer, Milwaukee, Wis.

o o o

Job

A GREAT deal is heard about job rating surveys or job analysis nowadays, but unless such a survey is actually conducted by a particular person the full significance of this device as an aid in personnel administration is not fully realized. It is difficult to realize, for example, that the proper use of an intelligent job rating survey will do wonders toward improving morale in the plant and assist in establishing the right attitude towards his work on the part of the employee. The reduction of labor turnover seems far removed from job rating. Yet these things and many other improved personnel relations result from complete use of rating surveys.

Of course the most obvious use to be made of job rating surveys is in wage and salary administration. In fact, at the personnel conference of the American Management Association in Chicago this year no other advantage was brought out for this management tool.

In the first place a sharp distinction should be made between *job rating* and *merit rating*, the latter having also become very popular in recent years. Job rating attempts to set down the requirements for a particular job without relation to the particular employee. Contrasted to this, merit ratings attempt to determine how well a particular employee handles the job he has been assigned to. There are as many merit ratings made as there are employees, but in a job rating survey only as many ratings as there are different kinds of jobs, usually considerably less than the number of employees. *Both job rating and merit rating are necessary in a well-rounded personnel set-up.*

In job-rating a plant, the work performed in each job is carefully studied, and specifications are drawn up listing the requirements in the way of education, working conditions, etc. The actual survey is usually accomplished to the best advantage by some outside agency. However, the benefits resulting from job rating analyses should not be denied a plant just because the management feels it cannot afford to have the work done.

Very effective job ratings have been accomplished by the personnel department or some other interested department within the plant. Any time and study spent on the work will usually pay dividends. Nevertheless, there are very definite advantages to having the survey work done by someone not connected with the plant.

In the first place the ratings carry more weight if made by a disinterested party. This item becomes important when the data is used to explain personnel changes to employees, as will be more fully commented upon later. Then, too, if the survey is made by an agency thoroughly familiar with the subject that has made similar surveys

Rating

SINCE the possibilities of job rating surveys in a plant are usually not completely realized until after the survey has been made, the advantages of personnel control are considered herein, in this first section of a two-part article. Discussed first are uses of job rating, checking of specifications, Number of jobs, etc.

o o o

in other plants, much time can be saved. Standard specifications can be used for a great many jobs in most industries, although specialized industries will require individually prepared specifications for almost every job.

Of course there is an important advantage connected with doing the rating job within an organization, particularly if representatives of the employees are included in the final conferences at which the job ratings are established. Securing agreement by the employees on each rating before it is established is more effective in getting complete acceptance of the plan than if the rating is done by a disinterested party.

But when all the plants of a community are rated by the same agency, there is the further advantage that wage rates can then be compared between the average for the community and the rate in the particular plant. Even if a wrong determination is made in a specific job, it will be consistently wrong in all the plants, and the rates will still be comparable.

When a rating of the entire district on the same basis as a particular plant is available, a comparison of rates for jobs which are unique for a particular business can be made. In other words even if there are no employees of a particular occupation in any other plant within the district, a particular employer can still determine if the rates for his men are out of line by comparing the rating for the job in question with the rate indicated on the chart for the entire district.

After the specifications are written up for every job, numerical values can be set for each factor depending upon the degree of the requirement. Here is the place where most of the controversy is likely to arise, because there is no scientific method of arriving at the weight which should be given to each factor. Consequently all systems are arbitrary and represent only the best judgment of the author of the particular system. Nevertheless, this seems to be the best approach to the subject at the present time, and a survey using valuations of the factors on some reasonable basis is many, many times more useful than no study at all.

The National Electric Manufacturers' Association applies the following values to the factors used in their surveys:

	Points Per Degree
Education	14
Experience	22
Initiative and ingenuity	14
Physical effort	10
Mental and visual effort	5
Responsibility for equipment	5
Responsibility for material	5
Responsibility for safety of others	5
Responsibility for work of others	5
Working conditions	10
Hazards	5

The National Electric Manufacturers' Association rating plan has been criticized from the standpoint that there is a top limit to which a job can be rated. Also it has been said that the divisions are not fine enough, a slight difference in opinion on several points having considerable effect on the rating.

Other systems are in use designed in such a manner that the rating possible to give an occupation is not limited at the top. The points of one particular system is based roughly on the cents per hour that the job should be worth, although of course this would not hold true in all districts.

Regardless of the system in use the weight to be given to the various factors is purely arbitrary. Anyone can weigh different jobs within a single requirement with a high degree of accuracy, but as soon as a particular person begins to say that experience is worth twice as much as education and three times as much as effort, he enters the field of opinion with practically no way of proving his contentions.

Uses of Job Rating

The following is a tabulation of the uses that should be made of a job rating survey:

(1) To determine the qualities necessary for a job when hiring new employees.

(2) To determine the qualities necessary for a job when making promotions.

(3) To determine if the system of advancement in the particular plant is from the job of the lowest order towards the job of the highest order.

(4) To determine the qualities necessary when bringing back men who have been laid off.

(5) To support explanations to the employees as to why a particular man would not be suitable for a given opening. Many seniority clauses give preference to length of service only after the requirements of the job in the way of experience, etc., are satisfied. The fact that the job rating has been made up by an independent agency as well as the fact that the entire plant was rated and not specific data on the job in question obtained will carry weight.

(6) To determine if the men now occupying the various jobs have the qualifications required by the specifications.

(7) To determine if all men are placed to the best advantage in the respective jobs available.

(8) To analyze hourly rates and to determine if they are in line with the rating given.

(9) To compare wage rates with similar occupations at other local plants.

(10) To point out where the greatest opportunities lie for development of automatic equipment and improvement of working conditions. Obviously a company would be in a much better position if all jobs could be reduced to the level of the lowest rating, thus making it possible to employ all unskilled labor, working under ideal conditions.

This perhaps should be explained more fully. Any plant where job ratings are very high indicating a predominance of highly skilled labor, usually is a plant where there are very few automatic operations. High ratings indicate the places where it is most likely that improvements in equipment can be justified.

(11) To train new supervisors. Obviously, specifications outlining the duties of each man are very useful in starting a new foreman out on the job.

(12) To facilitate explanations to an employee of the fact that any improvement in working conditions theoretically should mean a reduction in his wage rate. For example, if a worker is located in an unheated building and he insists on heat, resulting in the installation of heating equipment, this improvement in working conditions lowers his job rating. Theoretically, the rate for the job should be lowered accordingly.

Here again further comments are necessary. It is not advocated that

automatic machines be installed or that better working conditions be provided for the expressed purpose of lowering the workers' rates. However, if the employee is shown that he is paid a higher rate because his working conditions are not the best, he will probably be better satisfied with his job.

What Must Be Done?

To accomplish these results, it is necessary to give the following attention to details of the survey after the specifications are drawn up and rating work completed:

(1) Check specifications to see if there is agreement with rater's opinions.

(2) Determine if all jobs are included.

(3) Establish consecutive numbers to jobs for identification.

(4) Check number of men occupying each job.

(5) Keep accurate running records of number of jobs and number of men occupying each job.

(6) Determine by personal judgment whether the various elements used in making ratings are correct and logical to use as a basis for wage rates.

(7) Check wage rates and determine how they vary from the normal for each job.

(8) Set up wage rate bands for each job.

(9) Consider wage adjustments to get existing rates more in line with the theoretical.

(10) Consider the elimination of hourly rates altogether, establishing in their place a rate for each job.

(11) Analyze each man to see if he has the requirements called for in the specifications for his particular job.

(12) Consider a semi-rigid schedule of promotions from jobs of the lowest rating to those of higher ratings.

(13) Consider if the individual employee involved should be shown how his particular job has been rated.

(14) Get an overall picture of the types of labor used in the plant in question.

(15) As new jobs occur set up new specifications for them.

(16) As conditions are changed or machinery installed, the specifications for the particular job should be changed as well as the ratings.

(17) Check a merit rating system for each individual employee to determine how well he fits into the job specifications.

(18) Improve equipment and working conditions so as to reduce all jobs as far down the grading as is possible. An explanation of just what is meant by this statement has already been made.

Check Specifications

It is important that a careful check through the specifications on each job be made to determine if there is agreement with the rater on various items. If the rating is done by an outside organization, there may be a number of conditions he is not as familiar with as someone who has been in a particular organization for a long time. All of these should be the subject of criticism and group decision as to the final specifications that are allowed to stand for the particular job.

Care should be used in changing the original specifications, however. Criticisms should be directed toward specific jobs where a requirement inconsistent with the other ratings can be pointed out rather than changes made in an entire group of jobs. For example the superintendent may feel the rater has been too strict in setting values on equipment within the responsibility of *all* the employees. It would be wrong to raise these values on all the jobs, because if the rater is *consistently* low in all cases, the ratings will be comparable and will be in line with values set by the same rater in other plants. On the other hand if it is felt that the equipment in charge of the holder of a particular job is under valued as compared to the other jobs within a particular plant, that specification should be changed.

Probably the foreman will not agree that a particular hazard exists on a given job. After careful group consideration is given to the matter and it is felt that an accident in connection with the hazard is improbable, then that factor should be removed from the specifications and the rating.

Are All Jobs Included?

The usual job analysis includes only plant workers and does not extend to the supervisory force or the office. However, there is no reason why the same sort of analysis will not be beneficial in connection with salary workers.

Regardless of whether the survey covers the entire organization a check should be made to determine if any jobs have been omitted from those that are supposed to be covered. This can be easily accomplished by attempting to place each employee in some rated job. If there are any left over with no jobs for them to go into, of course specifications will have to be drawn up for them.

Numbers for Jobs

It is advisable to establish definite numbers for each job for purposes of identification. This is helpful in administration under unemployment benefit laws, because when an entire job is eliminated there is no compensation in some states. Moreover, numbering of jobs prevents duplication of specifications, particularly when different names are inadvertently applied to the same job. In addition to standardized numbers for each job, standardized names should be adopted for each job so a particular occupation will not be called "laborer" at one time and "carloader" at another.

Men Occupying Each Job

A running record should be kept of the number of men occupying each job as part of the company's labor records. This record can be kept daily or weekly, as is felt desirable, and will give a picture of the efficiency of operation insofar as number of men are concerned under various conditions of business.

Some of the occupations analyzed may not be full time jobs but may have men working at them occasionally or for part of the day. When such changes in work are frequent, the only practical way to keep track of them seems to be by means of job records where the men record the time spent on each occupation.

As part of the records a card file of the specifications decided upon for each job is serviceable. When any of the conditions change, of course the card must be changed accordingly.

ED. NOTE:—*Next week the author concludes this article with discussions on wage rate bands, wage adjustments, promotions, influence of improvement in equipment, etc.*

◇ ◇ ◇

RECENT OFFERINGS IN MOTORS, CONTROLLERS AND LIGHTING EQUIPMENT

By FRANK J. OLIVER
Associate Editor, The Iron Age

° ° °

SINCE the invention of the polyphase squirrel cage motor, many different types of rotor construction have been developed in the attempt to produce a more perfect winding, particularly one with greater mechanical strength and the ability to withstand high temperatures. Several one-piece rotors are in use today but up until very recently only such materials as aluminum, zinc and other white alloy metals have been employed. Now, with the announcement of the *Fairbanks-Morse* Copperspun rotor, there is available a motor with a rotor made of centrifugally cast pure copper. (Melting point 2000 deg. F., vs. 1100 deg. for aluminum.) The bars and end rings are formed in one piece by pouring molten copper into a mold that incases the punched laminations, stacked and held under pressure, while the assembly is rotated at high speed. As a result of the centrifugal force, a tough, tense, ductile copper winding is produced with high strength, full slots and uniform structure and conductivity. The rotor is then machined all over.

Specially designed fans have also been developed for this new rotor. One-piece steel fans are welded to the rotor core for open type motors; fans for splash-proof motors are shaft mounted. The external fans for fan-cooled and explosion-proof motors are cast iron and cast bronze with split hub for ready removal from the shaft extension.

Single-Phase Motors

ANOTHER innovation in rotor design is found in the type BSF repulsion-induction motors furnished in sizes from ¾ to 3 hp. by *Sterling Electric Motors, Inc.*, Los Angeles. To avoid the use of centrifugal short circuiting devices in a repulsion-start motor, a squirrel cage is buried under a repulsion rotor winding which is connected to commutators and brushes. During locked and low speed operation, the squirrel cage bars are not effective but as the speed approaches synchronism, both windings become effective. The company is also supplying a conventional repulsion-start induction motor with centrifugal short circuiting device in sizes from ⅛ to 1 hp., as well as capacitor types.

Multi-Speed Capacitor Type

REQUIREMENTS it formerly took six different motors to meet are found in a new line of capacitor motors developed by *Westinghouse Electric & Mfg. Co.*, East Pittsburgh, Pa., for unit heater, fan and blower applications. Built in sizes from 1/20 to ¾ hp., these motors provide single speed operation with the ordinary on and off switch for either 110 or 220-volt circuits, give high and low speed operations with the aid of a simple two-speed switch, or with a speed controller give multi-speed operation with either voltage. Sleeve bearings absorb shocks imposed by propeller fans and large oil reservoirs packed with yarn insure adequate lubrication. Rotors are ventilated.

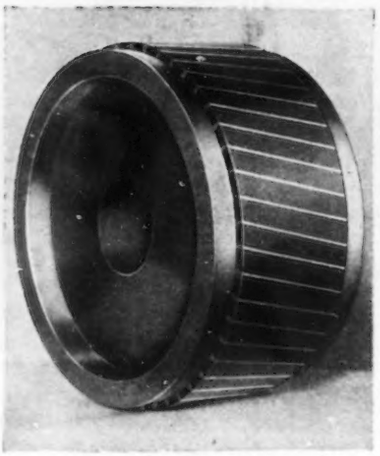
PRINCIPAL advance in motor design made in recent months has been the perfection of a centrifugally cast copper squirrel cage rotor. Among controllers, emphasis is placed on across-the-line starters of small size. A push button station is offered with plastic case and die cast base. Makers of industrial lighting equipment have brought out concentrator types, floodlight and high bay units. Further developments are also reported on fluorescent lighting apparatus.

Speed Regulator for D.C. Motors

ACCORDING to a paper presented by a group of Westinghouse engineers before a regional meeting of the American Institute of Electrical Engineers, a device has been perfected whereby the speed of a d.c. motor can be held constant within narrow limits from no load to full load. This *Westinghouse* speed regulator depends for its response on a flywheel or inertia member which is sensitive to rate of change of speed and to a member responsive to change in speed, both acting upon a single pair of contacts. This combination provides an anticipatory response which offsets the time delays experienced with most speed regulating systems and is anti-hunting in its action. The regulator, which has been used on motor-generator sets as large as 37 kva., is applicable to machines having large time delays where accurate speed control is desired.

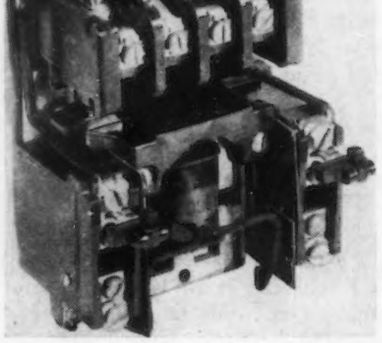
Frequency Changer for 25-Cycle Tests

WHERE 25-cycle electrical machinery is to be tested before shipment and only 60-cycle current is available, *Forbes & Myers*, Worcester, is offering a compact frequency changer for this purpose. Essentially, the unit is a 60-cycle synchronous motor, with merely the addition of an extra winding to give the desired 25-cycle



CENTRIFUGALLY cast copper is used for squirrel cage rotor construction for the first time in the Fairbanks-Morse Copperspun rotor. Because of its one piece construction and high melting point, it is especially adapted to severe service such as plugging or reversing duty.

THIS 1000-hp. size is one of the new type CS, two pole Westinghouse induction motors, featuring quiet operation with minimum windage noise and radio frequency tested insulation. Bearings are combined oil ring and forced lubrication. The wide grooved rings provide lubrication during interruptions that might occur to the forced lubrication system. These motors may be started at either full or reduced voltage and are particularly suited to centrifugal pump and compressor drives.



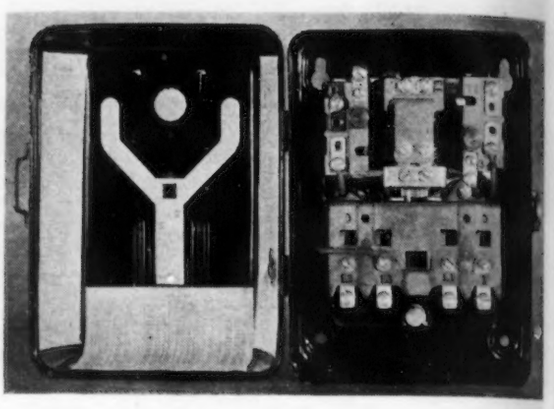
GENERAL Electric's new size 0 magnetic switch, while small in size, is built to standard specifications and is said to have the ability to withstand severe service conditions and has the same reliability as larger switches.

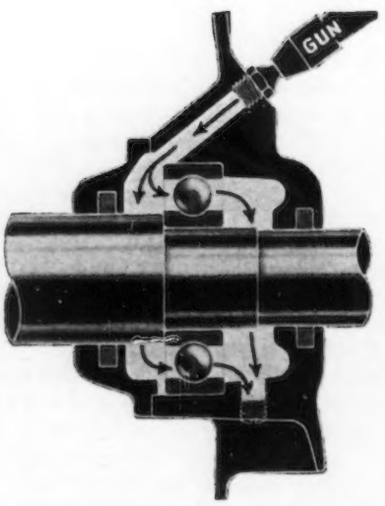
o o o

AT RIGHT

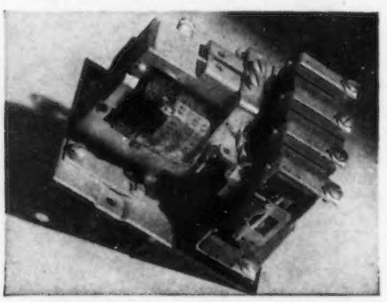
NEW Westinghouse across-the-line starter for ratings up to 2 hp., 220, 440 and 550 volts, two and three phase, and equivalent ratings on single phase.

o o o





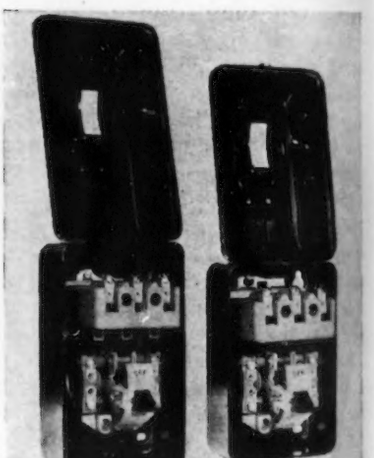
LUBRIFLUSH is the name given a new system of motor bearing lubrication whereby new lubrication is injected to the inner side of the ball bearing with a pressure gun and the old lubricant is forced out of the bearing through a drain in the lower part of the housing on the opposite side. The grease fitting and drain plug are easily accessible. This method is said to prevent the retention of sludgy substances and residue. This Lubriflush system is being applied to products of U. S. Electrical Motors, Inc., Los Angeles.



STYLE Dn-00 multi-pole contactors for use on machine tool and similar controls are offered by Westinghouse assembled as complete units on steel bases suitable for mounting on insulating or steel panels as part of the controller. These relays are arranged for front wiring of all connections.

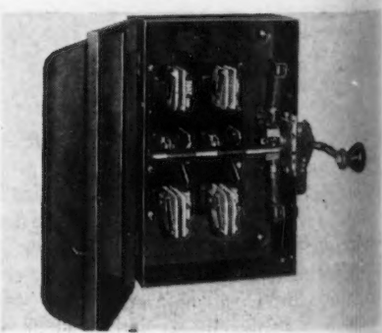
BELOW

DE-ION Motor Watchman across-the-line starters are now supplied by Westinghouse in two sizes, the smaller for motors up to 2 hp., the larger up to 7½ hp.



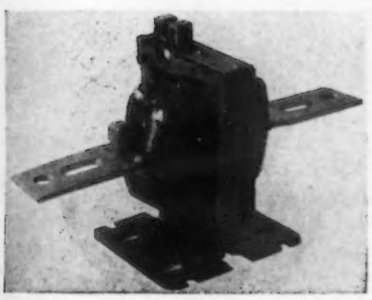
BELOW

THIS unfused Square D double-throw switch is furnished in capacities of 60, 100 and 200 amp., for either 230 or 575 volt a.c. or 250 volt d.c., and in either two or three pole. Of full A-type construction, these switches have the new V-type blade, multi-spring jaws and the familiar Square D compression spring design of the quick make-and-break mechanism. There are padlocking positions in the "off" and both "on" positions.



THE new type MO Square D Multi-breakeRs, priced low, come in capacities of 15 to 25 amp. for 115-230 volt service. Cutler-Hammer is also furnishing a type MO Multi-Breaker covering the same range.

o o o



ABOVE

WEIGHING only 8 lb. and designed in accordance with Edison Electric Institute standards is this Westinghouse type WE dry type, indoor current transformer, rated at 200 to 400-amp. capacity.

o o o

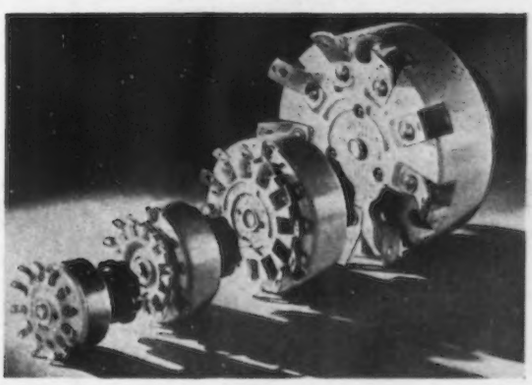
ABOVE

G-E Tamres tamper-resisting plug fuses are now available in capacities of 15, 20, 25 and 30 amp. They have standard medium Edison bases and can be used as an ordinary plug fuse without an adapter or as a tamper-resisting fuse with an adapter. The adapters, of two types, screw into the fuse holder ahead of the fuse. If the fuse is removed, the adapter remains in the cut-out and effectively resists any tampering.

o o o

BELOW

NEW series of Ohmite power tap switches rated at 10, 20, 40 and 75 amp. capacity at 240 volts a.c. Outside diameters range from 2¼ to 6 in.



AT RIGHT

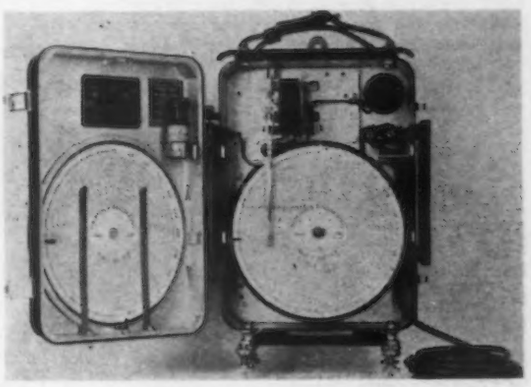
APPLICATION of a Thompson hanger to a Miller Ivanhoe mercury vapor unit, shown in partially lowered position. When the fixture is disconnected for lowering the electrical circuit is broken

o o o

AT LEFT

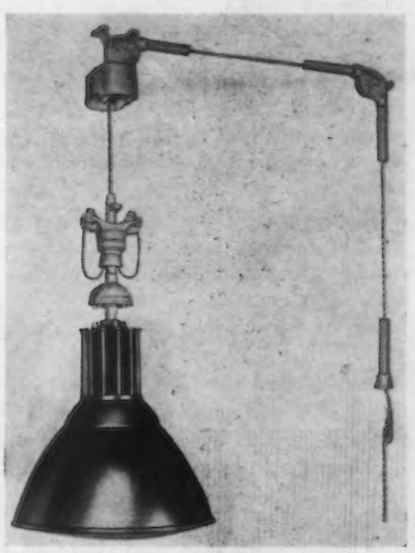
BAKELITE cover and die cast base distinguish the bulletin 800 Allen-Bradley push button control stations.

NEW 10-in. Westinghouse industrial concentrator with clear lens for spot lighting of fine assembly and manufacturing operations.



ABOVE

DESIGNED especially for survey work is the new round chart portable recording voltmeter, developed by the Bristol Co., Waterbury, Conn. Model 522MS is a self-contained instrument in a weatherproof case, equipped with adjustable mounting legs for pole or wall mounting, or it can be set on a table or on the floor. All parts are strongly constructed to withstand rough handling, but the unit is light in weight for portability.



THE Projecto floodlight, made by the Goodrich Electric Co., 2900 N. Oakley Avenue, Chicago, has been designed to provide a high degree of light projection and at the same time a wide spread of light. Fixture is finished in porcelain enamel and both the hood and bracket arm are cast aluminum. The bracket arm provides universal adjustment.

o o o

current at 110, 220, 440 or whatever voltage is desired, or all at the same time. The base of the unit contains terminals for each voltage, starter for push button control, rectifier for the field current and field rheostat for close voltage regulation.

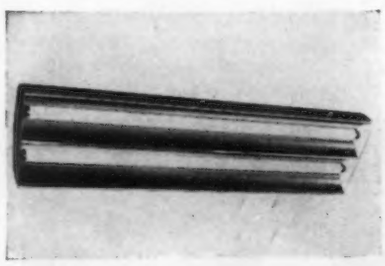
Across-The-Line Starters

THE demand for a full-voltage magnetic starter smaller in size and rating than those offered in the past, has resulted in the development of a new size 0 magnetic switch by the *General Electric Co.* This new device, in a number of popular forms, is available for use with single-phase motors up to 1 hp., 110 volts, and 1½ hp., 220 volts, or polyphase motors up to 1½ hp., 110 volts, and 2 hp., 220-600 volts. Made in two-, three-, and four-pole forms, the switch is available in general purpose, dust-tight, and water-tight cases. Forms are also available with a push-button or selector switch in the cover for local operation.

The magnet of the new switch is of the E-type with three sealing surfaces to decrease the hammer blow in closing. The contacts are double-break, made of fine silver, and are readily removable. Isothermic overloads are provided with a positioning spring which permits making the relay either hand or automatic reset.

A SMALL and inexpensive across-the-line starter for ratings up to 2 hp., 220, 440 and 550 volts, two and three phase, and equivalent ratings on single phase, is also announced by the *Westinghouse Electric & Mfg. Co.* They are used for across-the-line starting of squirrel cage induction motors and as primary switches for wound-rotor induction motors, such as are used to drive machine tools, conveyors and pumps. The new starters are available as plain across-the-line starters or in combination with motor circuit switches and Nofuze circuit breakers in standard inclosures. Principal features include De-ion arc quenching and snap-action bi-metal disk overload relay. The same line of heaters are used as in the De-ion Motor Watchman manual starters.

HIGH bay lighting unit furnished by Westinghouse for use with incandescent lamps. The reflector is attached by means of the Locklite principle of design.



WESTINGHOUSE concentrating type, two lamp fluorescent luminaire for general or supplementary industrial lighting applications.

o o o

Contactors For Built-In Use

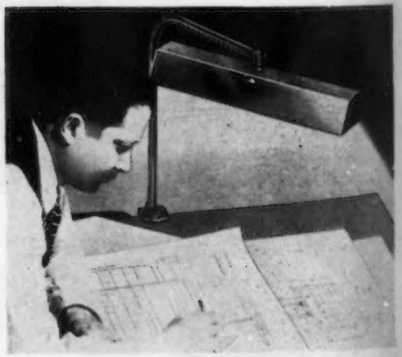
A LINE of multi-pole contactors for use on machine tool control and other built-in control applications is announced by *Westinghouse*. These relays are rated at 10 amp., 500 volts maximum, available in two- to eight-pole forms in any combination of normally open or closed contacts. In addition to individual relays, there are assemblies of two relays mechanically interlocked. Latched-in contactors or relays also have been developed, in which the contactors remain latched in position until separate releasing solenoids are energized.

Low Cost Circuit Breaker

THE *Square D Co.*, Detroit, announces an addition to its line of Multi-breakeRs. By reducing the size and limiting the capacity to 25 amp., the new type MO Multi-breakeRs are even lower in price than the original low-cost Multi-breakeR. The new models now in production are available in single or double pole devices having flush or surface mounting, with or without grounded or insulated neutrals. Capacities are 15, 20 or 25 amp. for 115-230 volt a.c. service.

Push Button Stations

A REINFORCED bakelite cover mounted on a die cast frame is used in the construction of the new bulletin 800 push button control stations recently announced by the *Allen-Bradley Co.*, 1311 S. First Street, Milwaukee. A conduit opening is provided at one end of the die cast frame, and only a single screw need be removed to lift the cover and get at the connections. Black is the standard color for the cover, but it may also be had in machine tool gray or in white. The buttons themselves are of red and black bakelite, and a flange on each button fits snugly into the recess of the cover to exclude dirt. The double break, silver contacts are located in recessed chambers. These



FLUORESCENT clamp-on swinging arm desk lamp suitable for drafting room and office is being marketed by the Mitchell Mfg. Co., 1550 Dayton Street, Chicago. It uses the new T-8, 15-watt fluorescent daylight bulb. Both arm and shade are fully adjustable. The metal shade is 18 in. wide. Entire unit is bronze plated.

stations are available in single and double button types, in both horizontal and vertical arrangements.

COMPACTNESS has been achieved in a new *Westinghouse* design of heavy duty push button station. The new apparatus consists of a double pole, double throw push button mounted in the same space as the ordinary single pole, double throw type. It has four contacts, two on each side of the button, and is supplied with either standard or long buttons. For wall or machine mounting, Westinghouse is also furnishing flush plate mounted stations with a wider plate than standard. For the single button station, for example, the plate size is 6⅜ x 4⅛ in.

Color for Switchgear

IN addition to the standard, sombre black, switchgear is being offered by *General Electric* in several new finishes such as light bronze, heavy bronze and pearly gray. Switchgear in colors other than black should tend to encourage better plant maintenance, it is pointed out.

Oil Circuit Breaker

A NEW switchboard type oil circuit breaker, capable of wide application to central station and industrial service has been developed by the Boston works of *Allis-Chalmers Mfg. Co.* Designated as type KD-20, this 50,000-kva. interrupting rating breaker is of particular interest because the three poles are arranged one behind the other as viewed from the front or operating end of the breaker. The arrangement of the bushings so obtained eliminates the necessity of crossing the leads in certain applications of open and inclosed type switchboards. For the same reason, it is adaptable for replacing obsolete breakers of the same arrangement, as existing bus and feeder connections may be retained.

The type KD-20 is equipped with large butt type arcing contacts. The main current carrying contacts, silver-plated, are of the wedge and finger type for 600 amp. and wedge and laminated brush type for 1200 and 2000 amp. Other features include: Bakelain bushings, inclosed low inertia high speed mechanisms, and vents to permit escape of gases incident to interruption.

Dry Type Transformer

TWO new indoor dry-type current transformers, rated at 200 and 400 amp., 600 volts, and 600 amp., 600 volts, have been announced by *Westinghouse*. These transformers are entirely interchangeable with other transformers designed as these are to meet Edison Electric Institute specifications. The smaller unit is accurate for continuous operation up to 150 per cent of normal current. On overcurrents, the 200 and 400 amp. transformer will mechanically withstand 250 times normal current, and thermally the windings will stand 80 times normal current for 1 sec. The larger unit will withstand much greater overloads comparatively for instantaneous over-current.

SIMILAR in outward appearance to the No. 411 storage battery hand lamp recently announced by the U-C Lite Mfg. Co., Chicago, is the Big Beam No. 1000 hand lamp, powered by a 9-volt Burgess 4F6H dry cell battery. Battery to lamp contacts are automatic, eliminating interior wiring. The lamp is said to project a powerful ray over 2500 ft. An interchangeable floodlight spreads the light over a wide area for close-up work. The main bulb will operate 8 to 10 hr. continuously, while an auxiliary bulb will operate for about 100 hr.

THE Berloy Parab-O-Lume ceiling unit is a parabolic reflector transformed to a flat surface. Installed in sections around and above an indirect lighting fixture, this new reflecting ceiling unit directs the light rays straight down upon working surfaces. Units are made in steel sheets stamped in prismatic design and coated with aluminum paint having a reflective factor of 78 per cent, said to be more efficient than a flat white ceiling. Units are made in standard sizes of 6 x 6 ft., 8 x 8, 10 x 10 and 12 x 12 ft. Supplied by Berger Mfg. Division, Republic Steel Corp., Canton, Ohio.

o o o

BELOW

ALL-RUBBER weatherproof lampholder announced by the General Electric appliance and merchandise department, Bridgeport, Conn. The rubber jacket is equipped with a shadeholder groove, and the tinned screw shell is inclosed in such a way that it can neither turn nor come loose.

FLUORESCENT lamp auxiliaries are assembled in this compact case for concealed installation in strips, channels and lamp fixtures. Sizes are made for various fluorescent lamp capacities. The entire unit is sealed in an all-weather resisting compound. Supplied by the Jefferson Electric Co., Bellwood, Ill.

Power Tap Switches

EXTREMELY compact power tap switches, ranging in capacity from 10 to 75 amp. at 240 volts, are now being built by the *Ohmite Mfg. Co.*, 4835 Flournay Street, Chicago. The smallest size, model 212, is only 2¼ in. in diameter and the largest of the four, model 608, 6 in. These new tap switches are multi-point, load-

(CONTINUED ON PAGE 96)

THIS WEEK ON THE ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

. . . Fighting in central Europe already affecting truck exports . . . Detroit sees increased buying from neutrals . . . General Motors' gain lifts industry's production for week to 25,240 . . . New labor troubles threaten, but employment steadily rises.

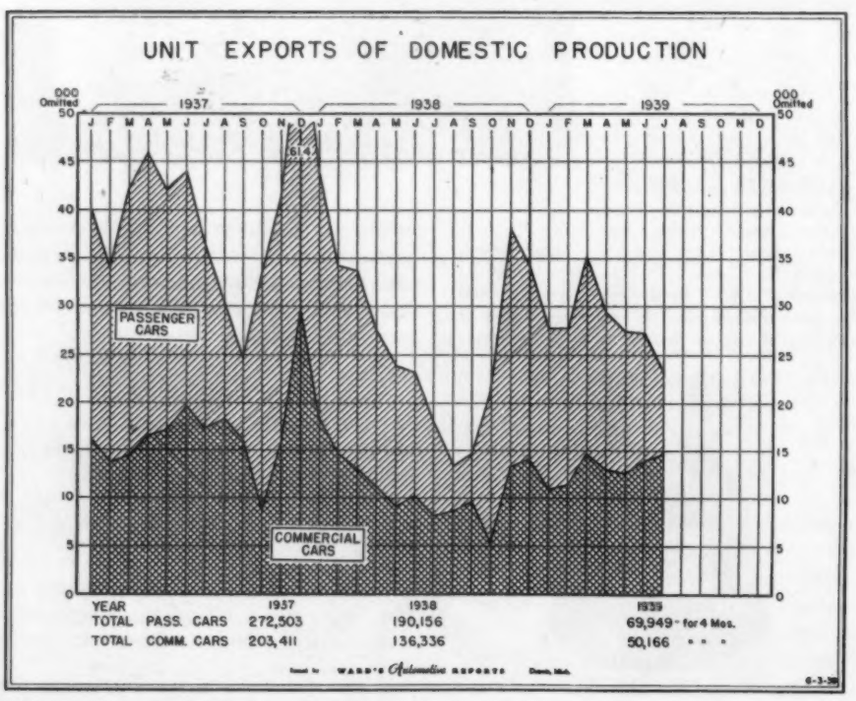
DETROIT—The outbreak of fighting in central Europe, and the depressing effect of such action on the world's economics, is being felt in the automobile and truck plants. Export volume, which has accounted for approximately 10 per cent of 1939 production thus far, has shrunk rapidly in the past fortnight, and will diminish, it is felt, to much more contracted proportions during September.

The outlook from this standpoint is not altogether bleak; there is a widespread belief that the Neutrality Act will be so amended as to permit belligerents to obtain their needs in their own ships, as is desired by Mr. Roosevelt. If such a change is made, Detroit circles anticipate that the stimulus of armament demands will provide a soaring market for American vehicles, particularly trucks. Shipments on these latter, it may be remarked, have been substantial all of this year.

Exports See-saw

As is shown by the accompanying chart, the see-saw of export totals has risen as high this year as 35,295 units—20,555 passenger cars and 14,740 trucks. This was in March. The first seven months of this year have seen produced 2,171,256 assemblies in the United States; of these 208,141 have been shipped abroad, either disassembled or as complete units.

Naturally, even the first shock of European hostilities will not eliminate export markets completely. Our principal market for cars is Canada ($38,637,419 worth of car exports in 1938) and our second best the Argentine. The effect of a widespread European war on Canada is not completely clear at this moment, but it would not seem that our commercial relationships with Argentina would be disturbed—in fact, the normal assumption would be that U. S. automotive and other factories would be able to increase their trade in the Argentine and in other South American countries, due to stoppage of the flow of exports from the United Kingdom, Germany and other major nations whose production would be absorbed by war needs.



25,240 Units Last Week

Plant managers divided their time this week between watching Europe and trying to move their production lines at normal speed. Some delays were noted at various factories incident on normal model-start difficulties, such as fitting fenders to bodies, or adjusting jigs and fixtures to fit properly.

None of such troubles was of major proportions, however. Last week saw produced, according to the estimate of Ward's Reports, some 25,240 units. This compared with 17,465 in the preceding week and with 22,165 at this time last year. Most of the current rise was attributed to General Motors, whose plants completed 7200 cars, almost 5000 up. Chrysler's total was mildly up, despite the midweek conclusion on 1939 model Dodge trucks, and all Ford operations were at a standstill.

At an informal press gathering it became fairly definite that Chevrolet, delayed because of the craft shop strikes in General Motors in July, would have no passenger cars off its lines until late September, possibly early October. Truck manufacture, however, will be under way the middle of this month. The defection of Chevrolet passenger cars, however, will make the week-by-week production climb this month a less spectacular

At Cleveland
The newest tool room precision

This is the largest of the three Pratt & Whitney Jig Borers we will have in Cleveland. They will be doing precision boring to "tenths," at a speed that will be a revelation. There will be many kinds of jobs being done, and there will be skilled operators to answer your questions. Don't miss visiting the Pratt & Whitney Tool Room.

Booth No. 5608

THE PRATT & WHITNEY exhibit in Cleveland will contain a complete tool room . . . the kind you would like in your own plant. Here will be assembled the newest precision machines . . . Lathes, Shapers, Jig Borers, Thread Millers, Surface Grinders, Die Sinkers, Gear Grinders, Flexible Shaft Machines and Keller Automatic Tool Room Machines. In the center will be a tool crib with the latest Small Tools and Gages . . . and with experts to show you the latest methods in precision metal cutting and production gaging. Here is your best chance in years to learn the newest tool room precision practice. Talk to the Pratt & Whitney men at our exhibit. See our machines and tools, and the things they will do to make your work easier, better and more profitable. Be sure to see the Pratt & Whitney Tool Room.

PRATT & WHITNEY

DIVISION NILES-BEMENT-POND COMPANY

affair than it might have been. Current Detroit estimates now are that between 150,000 and 180,000 vehicles will be completed in September—an estimate made uncertain primarily by the lack as yet of definite schedules from Ford.

Steel Requirements

Certain it appears, however, that there should be good releases of steel out of the auto plants this month. Large requirements will be needed for Chevrolet some time before the end of the month, and Ford will almost certainly be needing body steel in a matter of days. Sub-assembly operations in the giant Ford Rouge plant are already under way.

In the meantime, the first pilot cars and show models were completed late last week at the DeSoto plant, and a start was made on volume assemblies at Cadillac-LaSalle. So as things stand the only factories which are not yet manufacturing 1940 cars are Chevrolet, Ford-Mercury, Lincoln, Chrysler, Graham, Hupp and Willys—of which the last-named will be under way about the time this appears in print.

Felt to be of more immediately pressing import to production than a European outbreak is the more or less continued outbreak of labor in the auto plants. Latest eruptions were, significantly enough, in three bearings plants—Federal Mogul Corp., Bohn Aluminum and Brass Corp. plant number one at Detroit, and Detroit Aluminum and Brass Corp.

Wage Increases Sought

Most auto companies have at least two sources of supply on bearings, but the three walkouts at Detroit conceivably could shut down one or two of the independents if the disputes are not settled within a week or so. The inevitable union shop contract demand has made its appearance at all three places, along with the equally ever-present cry for wage raises. Little progress appears to be made in the first meetings of the UAW-CIO with the respective managements.

Executives have greeted the one-sided victories of the UAW-CIO over the UAW-AFL at Packard and Motor Products with mixed emotions. Close votes might have meant disastrous jousting for strength among the two segments of the auto workers, but the one-sided votes have certainly appeared to revive militancy among the rank and file as well as the union leaders. A paragraph in the most recent union paper, which may or may not have been significant, made caustic mention of Chrysler's earnings in the first six months of 1939 and then urged workers to wait a while, and see how some of that money would find its way into pay envelopes after the NLRB election a few weeks ahead in the Chrysler plants.

Employment Rising

Employment throughout the industry is steadily rising. Hudson called back 2000 men to work late this week, bringing the payroll to 11,000. Announcement was made that the new models have been received more enthusiastically than any in the past 10 years. This was borne out by production statistics which showed output last week at an 11-month high.

Packard, similarly, is producing at an exceptionally rapid rate. The assembly total last week was at a level unreached in almost two years. Nash is steadily advancing, and anticipates that later this month the rate of assemblies may be the fastest in the company's history. Employment is already within 8 per cent of an all-time high. Studebaker, too, is bringing output rapidly toward the peak points established when the small Champion series was introduced last spring. Such activity on the part of the big four among the independents presages well for this branch of the industry, whose role has been a constantly diminishing one in the past decade.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

WE WAS RAISED TOGETHER AND HE HIGHHATS ME BECUZ HE RUNS A LITTLE BOOK STORE — WHY, IT TAKES TWICET TH' BRAINS TO BE A GOOD MACHINIST AS IT DOES TO SELL A BOOK
WELL, WE'RE MECHANICS IN A MECHANICAL AGE — BUT WE DON'T GIT NO RECOGNITION AN' GLORY LIKE A SOLDIER IN WAR TIME
DON'T YOU THINK IT'S TH' COAT OF MECHANICS TAN THAT WE HAVE ON IS WHY OUR FRIENDS DON'T SEEM TO RECOGNIZE US?
WITH ALL TH' APPLIANCES MECHANICS BUILD TO MAKE LIFE EASY, PEOPLE 'ER GITTIN' TO HATE TH' SIGHT OF WORK AN' WE LOOK LIKE WORK
COPR. 1939 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.
INDOOR TAN
9-1

Large Nickel Plating Plant is Completed

STANDARD STEEL SPRING CO. has recently completed what is said to be the largest nickel plating tank in the world. The operating volume of the new tank is 27,500 gal. The tank is fabricated of ⅜ in. steel plate lined with ¼ in. of rubber. The inside dimensions of the tank are: length 67 ft. 7 in.; width 6 ft. 10 in.; depth 8 ft. 3 in. The weight of the nickel anodes in the tank is 33,000 lb. This tank is used in nickel plating automobile bumpers. The company recently introduced a new pore-free coating, "Corronite." Data on this coating will be made available for the first time at the Metal Show in Chicago, Oct. 26-30. This coating is said to exceed the corrosion resistance of present coatings.

FEDERAL GOVERNMENT AWARDS

Steel Orders $396,972 For Week Ended Aug. 26

WASHINGTON — Government orders for iron and steel products, as reported by the Labor Department's Public Contracts Division for the week ended Aug. 26, totaled $396,972. For the same period, contracts for non-ferrous metals and alloys amounted to $114,193 and for machinery, $610,645. Companies receiving the orders, the government agencies making the awards, the products ordered, and the amounts involved follow:

o o o

Iron and Steel Products

United States Steel Products Co., New York City, Panama Canal, fencing material	$47,892.58
Aluminum Co. of America, Edgewater, N. J., War, Ordnance, forgings	14,751.75
E. Behringer Sheet Metal Works, Inc., Newark, N. J., Navy S & A, shells, head, steel	30,375.00
C. O. Jelliff Mfg. Corp., Southport, Conn., Navy S & A, cloth, wire	11,024.11
Walworth Co., New York City, and Greensburg, Pa., Navy S & A, valves	11,410.00
Inland Steel Co., Chicago, Indiana Harbor, and Pittsburgh, Navy S & A, steel, bar	74,400.00
Allegheny Ludlum Steel Corp., Watervliet, and Dunkirk, N. Y., War, Ordnance, steel rod, annealed	48,225.00
John J. Riley Co., Brooklyn, N. Y., Navy S & A, slabs, cast iron	11,239.50
Bethlehem Steel Co., Bethlehem, Pa., Navy S & A, steel, bar	Indefinite
Joseph T. Ryerson & Son, Inc., Chicago, Bethlehem Steel Co., Bethlehem, Pa., and Sparrows Point, Md., Newport Torpedo Station, sheet steel	12,167.42
Jones & Laughlin Steel Corp., Pittsburgh, Navy S & A, angles and shapes	51,310.57
Alemite Division Stewart-Warner Corp., Chicago, Procurement, lubricating guns	Indefinite
Joseph T. Ryerson & Son, Inc., Chicago, Navy S & A, steel	31,988.04
Beatrice Steel Tank Mfg. Co., Beatrice, Neb., Agriculture, bins	52,188.80

Non-Ferrous Metals and Alloys

Central Die Casting & Mfg. Co., Chicago, War C W S, nozzles, elbow	$18,600.00
Chase Brass & Copper Co., Inc., Waterbury, Conn., War C W S, brass, sheets	12,420.12
The American Brass Co., Waterbury and Ansonia, Conn., War, Ordnance, brass rod	12,736.00
Riverside Metal Co., Riverside, N. J., Treasury, bronze blanks for U. S. 1c. pieces	38,250.00
International Minerals & Metals Corp., New York City, Navy S & A, copper, ingot	15,591.00
Jones & Laughlin Steel Corp., Pittsburgh, War C W S, tinplate	16,596.58

Machinery

Elliott Co., Jeannette, and Ridgway, Pa., War, Air Corps, blowers and data	$26,650.00
Brown & Sharpe Mfg. Co., Providence, R. I., Navy S & A, machines, milling	17,784.00
Hardinge Brothers, Inc., Elmira, N. Y., War, Ordnance, lathes and equipment	24,670.50
Cincinnati Milling Machines & Cincinnati Grinders, Inc., Cincinnati, War, Ordnance, machines, milling	43,254.25
Van Dyck Churchill Co., New York City, War, Ordnance, machines, milling	13,917.00
American Machine & Metals, Inc., East Moline, Ill., War, Ordnance, testing machines	13,327.00
Kearney & Trecker Corp., Milwaukee, War, Ordnance, milling machines	26,706.60
Pratt & Whitney Division Niles-Bement-Pond Co., Hartford, Conn., War, Ordnance, milling machines	35,856.00
The Foote-Burt Co., Cleveland, War, Ordnance, broaching machine	18,165.00
Brown & Sharpe Mfg. Co., Providence, R. I., Navy S & A, machines, milling	14,912.00
Kearney & Trecker Corp., Milwaukee, Navy S & A, machines, milling	17,107.25
The Warner & Swasey Co., Cleveland, Navy S & A, lathes, turret	11,750.02
F. J. Stokes Machine Co., Philadelphia, War, Ordnance, pelleting presses	13,650.00
Pratt & Whitney Division Niles-Bement-Pond Co., Hartford, Conn., War, Ordnance, lathes	11,614.00
Addressograph Multigraph Corp., Addressograph Division, Cleveland, Ohio, Procurement, machine, automatic addressing	47,100.00
The Sharples Corp., Philadelphia, Navy S & A, purifiers, oil	34,951.98
Gar Wood Industries, Inc., Detroit, Procurement, wagon scraper	20,700.00
Caterpillar Tractor Co., Peoria, Ill., War Q M C, tractors with scrapers	35,902.00
M. L. Bayard & Co., Inc., Philadelphia, Navy S & A, winches	29,500.00
Wagler Equipment Co., Milwaukee, Procurement, reforestation planting plows	21,310.00
American Blower Corp., Cincinnati, War, Air Corps, fan assembly	11,380.00
G. S. Blakeslee & Co., Chicago, Navy, Marine Corps, washing machines	10,837.50
Acme Coppersmithing & Machine Co., Oreland, Pa., War, Ordnance, ether recovery equipment	96,000.00
The Vulcan Copper & Supply Co., Cincinnati, War, Ordnance, ether and alcohol continuous rectification equipment	13,600.00

Engineers To Study Coal Use Advances at Columbus

MANY recent advances in the use of bituminous and anthracite coal will be discussed at a joint meeting of the American Institute of Mechanical Engineers and the American Institute of Mining and Metallurgical Engineers scheduled for Columbus, Ohio. Mining methods, engineering service, new firing equipment, slag research, testing techniques, flame photography, steel melting, and the manufactured gas industry are some of the subjects relating to the central theme of coal utilization on which well-known authorities will speak.

Weirton Orders Steam Turbine Unit from Allis-Chalmers

PITTSBURGH—Weirton Steel Co., Weirton, W. Va., has ordered a Topping steam turbine and generating unit from Allis-Chalmers Mfg. Co., Milwaukee, to augment power facilities at its plant. The unit's capacity is to be 10,000 kw. at an 80 per cent power factor and 12,500 kw. at a 100 per cent power factor.

2000 More Steel Workers Employed During July

THE average number of employees in the steel industry increased during July to 453,000, as against 451,000 in June. In July of last year, an average of 424,000 were at work in the industry.

Steel payrolls in July totaled $59,900,000 against the June total of $61,150,000 and $45,802,000 in July, 1938.

Hourly earnings of the wage-earning employees in the industry averaged 85.9c. per hr. in July, which compares with 84.8c. in June and with 84.8c. in July, 1938. Wage earners worked an average of 31.0 hr. per week in July, as against 33.5 hr. per week in June.

Ross President of Columbia Steel

WILLIAM A. ROSS has been elected president of Columbia Steel Co., subsidiary of United States Steel Corp., succeeding Ambrose N. Diehl, who has resigned because of ill health.

Mr. Ross has been connected with the steel industry since 1895, when he went to work for the old Washburn Moon Mfg. Co. as an office boy.

With his resignation, Mr. Diehl closes an active career of 40 years' service to the steel industry. Beginning in 1899, Diehl entered the employ of Carnegie Steel Co. as a chemist in the laboratory of the Duquesne works. In 1930 he was made vice-president of U. S. Steel and in 1932 was sent to San Francisco to head the new Columbia Steel.

THIS WEEK IN WASHINGTON

. . . Roosevelt believes U. S. can stay out . . . War Resources Board ready to mobilize industry . . . Old war board's plan of price fixing, priorities, conservation and Army-Navy studies are used to prepare for new emergency.

o o o

By L. W. MOFFETT
The Iron Age

o o o

WASHINGTON — President Roosevelt has said that he hopes and believes that the United States can keep out of war. His hope expressed the overwhelming sentiment of the country. His belief unfortunately runs contrary to that of a large section of the country, provided a majority conflict develops in Europe and lasts six months or more. However, there is a general feeling that if the country avoids a fatalistic attitude toward being dragged into war, and disregards propaganda, the chance of the United States escaping involvement will at least be improved.

But if it does become involved industry, finance, agriculture, labor and all other elements of economic and social life will be transformed to a fast regimentation which will mean a complete readjustment of the life of the country which promises to be even more stringent than that of the World War. In the minds of many, a major war will threaten civilization itself or at least an enduring change from a private to a government economic system.

Rigid Control Seen

For industry, if war comes to the United States, there will be rigid control as a necessary and to-be-expected corollary. It is not difficult to visualize what it will mean to the steel and other industries. With the War Industries Board as a broad pattern for its operations a picture can be outlined of the work ahead in case of emergency for the War Resources Board. The latter will have the advantage the WIB did not have of coordinated plans for industrial mobilization. The WRB will have a better idea for the fixing of a program. Industry itself has been surveyed and its capabilities recorded, something unknown to the WIB. The Army and Navy military and industrial establishments are in a much better condition for an emergency than they were when the WIB was confronted with their demands. Means for better transportations than in the earlier war days now are at hand. So some of the problems which the WIB had to contend with are simplified for the WRB, though it is conceivable the present board may have to contend with difficulties that the old board did not have to meet.

Operate Like Old Board

But on general lines the WRB will operate as did the WIB. Therefore, a sketch of the latter's administration as it related to the iron and steel and related industries will indicate what the roles of these industries will be under a tight central control by the WRB. It will mean, in all probability, the application of the same principles were invoked by the WIB. These were priorities, price fixing and conservation.

Taking over the duties of the Munitions Standards Board and the General Munitions Board, the War Industries Board was established by order of President Wilson, July 28, 1917, under the Counsel of National Defense. Later the Board was reorganized and was dissolved Nov. 30, 1918, about three weeks after the armistice. Heading the Board was Bernard M. Baruch.

17% Of Output For War

The need of information to denote requirements for preparedness is strikingly indicated by the experience of the WIB. Taking up a study of the iron and steel industry as one of the first to be considered, early estimates were that only about 17 per cent of the finished steel output, then about 35,000,000 tons, would be required to supply all war needs. The Allies were buying steel in the United States in terms of millions of dollars before the United States declared war, April 6, 1917, as pointed out by Mr. Baruch in his report, "American Industry in the War," to President Wilson.

After negotiations with steel makers, the President on Sept. 24, 1917, made formal announcement of the prices which had been fixed by agreement on the basic raw materials of the iron and steel group. These prices served as the basis for all price fixing in this group and made effective immediately, subject to revision Jan. 1, 1918.

The prices were:

Iron ore, lower lake ports, $5.05 per gross ton
Coke, Connellsville, $6.00 per gross ton
Pig iron (basic), $33.00 per gross ton
Steel bars, Pittsburgh-Chicago, $2.90 per 100-lb.
Shapes, Pittsburgh-Chicago, $3.00 per 100-lb.
Plates, Pittsburgh-Chicago, $3.25 per 100-lb.

The agreement provided that there should be no reduction in the rate of wages and that the prices should be made to the public and to the Allies as well as to the government.

Price Decline Followed

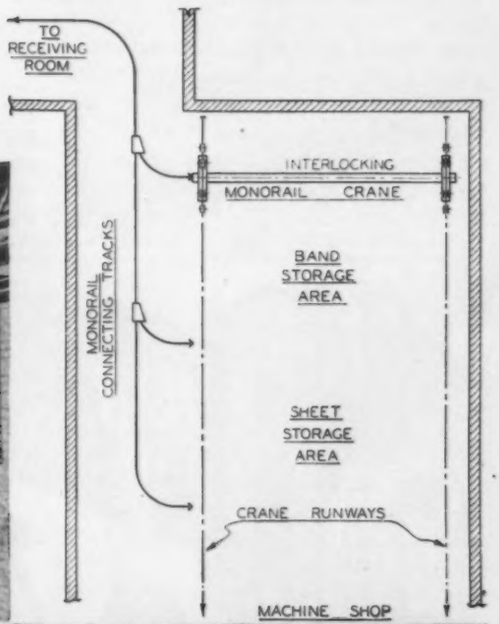
The agreement brought a sharp drop in prices, coke from 12.75, pig iron from $60, steel bars from $5, shapes from $6 and plates from $12.

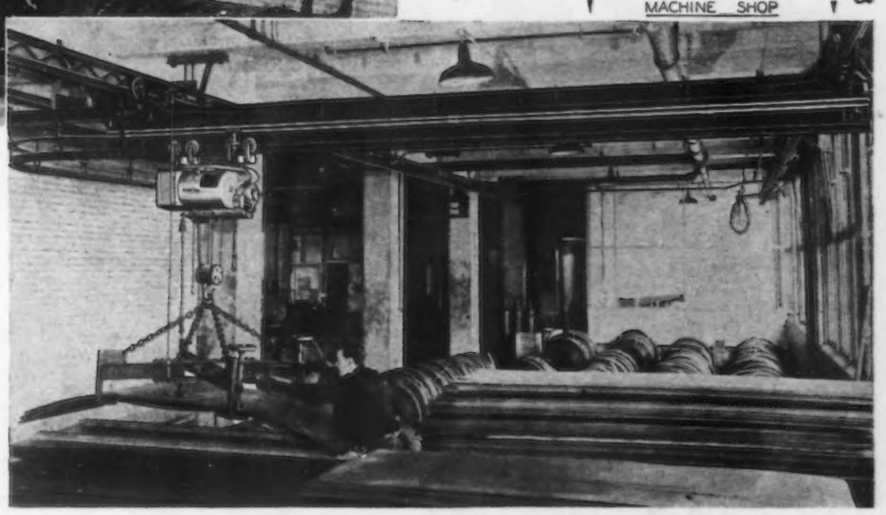
Previously (Sept. 15, 1917) J. Leonard Replogle was appointed director of steel supply for the WIB. He became chief of the steel division and remained in that position throughout the war. Frank Purnell became assistant director; Jay C. McLauchlan, chief of the pig iron section; D. E. Sawyer, chief of rail and projectile section; J. Searle Barclay, chief of Permit section; Frank E. Thompson, chief of Finished Steel Products section; Herbert H. Weaver, chief of Emergency Fleet section; W. Vernon Phillips, chief of Scrap section. P. Mackall was made European representative and Percy R. Withy was made statistician.

On Oct. 11, 1917, maximum prices per gross ton at Pittsburgh and Youngstown were fixed for semi-finished steel. Some of the prices

Low-cost Handling System

Steel moves from receiving dock to storage over this simple American MonoRail system at low handling cost.





Special coil hook, electric hoist, crane and connecting tracks make up a system that permits one-man control of the entire stock.

•

Manually operated sheet grab assures safe handling of unit loads direct to process machines, eliminating damage or re-handling of individual sheets.

•

A 254 page book used as a technical reference for all data covering Mono-Rail equipment will be sent on letterhead request.

Since no two overhead handling problems are alike, low-cost solutions are found only in a system that offers extreme flexibility of basic design.

American MonoRail equipment meets varying requirements at low initial cost because standard parts of such flexible design are fabricated into special units and co-ordinated into systems guaranteed to produce the results intended.

For either manual, electric or automatic operation these systems invariably overcome operating congestion, eliminate costly maintenance and reduce handling expense wherever applied. Engineering consultation is available without obligation.

THE AMERICAN MONORAIL COMPANY

13103 Athens Avenue, Cleveland, Ohio

were: Blooms and billets, 4x4 and larger, $47.50; sheet bars, $51; wire rods, $57; shell bars, $3.25 to $4 per 100-lb.; universal skelp, $2.90 per 100-lb. On Nov. 11, 1917, prices per 100-lb. at Pittsburgh were fixed for finished steel. No. 28 black sheets were given a price of $5; plain wire, $3.25; tin plate, $7.75. The No. 1 heavy melting scrap price was fixed at $30.

In order to fully control prices, a large schedule of differentials was worked out. Mr. Baruch reported that by late September virtually the whole industry was disposed to recommend that formal regulation begin.

Also Rules For Jobbers

The rationing system, rigid and far-reaching, was adopted on July 22, 1918. Along with other services it gave, the system of control was reached by agreement with the American Iron & Steel Institute, which had set up committees to cooperate with the Government in helping to meet the demands as given through the director of steel supply. There were rules also for jobbers as well as for manufacturers.

"The iron and steel industry was, on the whole, one of the most important centers of approach to the control over the vast number of manufacturing industries which the progress of the war was making necessary," Mr. Baruch replied. "The difficulty and complexity of the undertaking was realized by no one more fully than by those who were engaged in it. It is possible that mistakes might have been made. But it is believed that central control, involving as it did an almost impossible amount and quality of work on the part of those at the apex, resulted in advantages of far greater importance than the individual cases of loss and distress which might have accompanied it."

Previously, in speaking of plans for regulation, Mr. Baruch said:

"One of the principal trade journals, THE IRON AGE, began predicting regulation in late June, and was frankly advocating it in the issue of Aug. 30," he stated. "Thus, before control was actually put into effect, the government and the industry were in a state of mind to sit around the same table and determine together what kind of control they wanted and how it should be exercised."

On Quarterly Basis

The original prices on iron and steel were renewed every three months. Production during 1918, under fixed prices, fell a little below production in 1917. But, Mr. Baruch pointed out, it hardly can be said that price fixing was a significant cause. The iron and steel industry, it was pointed out, in common with all industries, suffered during the winter from the transportation tie-up. The director of steel supply finally, to eliminate cross-hauls, rearranged many contracts, some of which had been placed directly with the steel manufacturers at varying prices on a strictly competitive basis by the nations at war and "naturally placed without regard to the transportation factor." Control of distribution was assumed through a system of priorities under a number of classifications according to the needs.

Problems in the machinery and machine tool industries were handled by the Resources and Conversion Section, which, among other things, converted factories making wood-working machinery, etc., into the manufacture of metal-working machinery. It also

BEHIND EVERY DINGS HIGH INTENSITY LIFTING MAGNET!

40 YEARS of experience in the design and construction of *nothing but magnetic equipment* — 40 years of pioneering and research—years that have produced some of the most powerful magnetic machines ever built—that's the background that produced the line of Dings *High Intensity* Lifting Magnets.

Dings Magnets have exclusive features of design found in no other magnet—features that mean bigger payloads, more profits and lower costs for you.

Dings High Intensity LIFTING MAGNETS

Send for Catalog Today!

It contains information of interest and value to any one concerned with metal handling. DINGS MAGNETIC SEPARATOR CO., 727 Smith St., Milwaukee, Wis.

LIFTING MAGNETS • CLUTCHES • SEPARATORS

assisted several concerns in securing patterns, drawings and other information needed to develop machine tool plants. The producing capacity of the country was kept carefully tabulated so that prompt instructions could be given showing by what plant and in how long a period any certain order of machine tools could be produced. This industry, Mr. Baruch reported, developed during the period of the war from a capacity represented by an annual output of about $50,000,000 to that of an output estimated at nearly $400,000,000 in 1918.

Headed By Stettinius

The WRB was set up Aug. 9 of the present year with the approval of the President as a civilian advisory committee to the Army and Munitions Board. The following were appointed as members of the board:

Edward R. Stettinius, Jr., chairman of the board, United States Steel Corp. (chairman), Karl T. Compton, president, Massachusetts Institute of Technology, Walter S. Gifford, president, American Telegraph & Telephone Co., Harold G. Moulton, president, The Brookings Institution, John Lee Pratt, director, General Motors Corp., and Gen. Robert E. Wood, chairman, Sears Roebuck & Co. Other members will be appointed at a later date. Col. Harry K. Rutherford, U. S. Army, was designated as Secretary to the Board.

The duties of the Board are those of advising Army and Munitions Board on policies pertaining to the mobilization of economic resources of the country in the event of a war emergency and in reviewing and perfecting plans previously under preparation by the Army and Navy Munitions Board. The latter board recently was made directly responsible to the President instead of to the Secretary of War and Navy as formerly. In case of emergency the WRB would become an executive agency of the government to draw powers similar to those of the old WIB. In such an event the board would report directly to the President as a War Resources Administration.

Perfect Present Plans

The WRB held its first meeting in third week of August after which Mr. Stettinius said the board will consider primarily how the industrial and economic resources of the nation can best be prepared for the part to be played in the event of war. Mr. Stettinius said that for the present the board will consider what additional steps appear desirable for perfecting the plans on which the War and Navy Departments have been working for years.

"It appears to us to be wholly desirable and even essential that these plans should combine both the civilian and the military viewpoints," he said.

Acting Secretary of War Johnson said that as a result of experience of the old WIB it appears probable that authority for final decisions would be given to the chairman of the War Resources Administration rather than to the group as a whole. He said the only exception would be that on price fixing. The chairman would be governed by the conclusions of a price control committee.

Price Control Studied

The WRB has been holding meetings in Washington each week since it was established and last week made a report to the President. The character of the report was not announced.

Your Wyandotte Service Representative is as near as your telephone. He is always on the job, always on call—ready to help.

In this day of rapidly changing metal finishes—when time allowances are shortened and volume is increased—it pays to have expert metal cleaning advice on tap in case trouble pops up.

Frequently a call to your Wyandotte Service Representative is all that is needed to keep your production schedule going. If he can't supply you with the proper metal cleaning compound, he will be glad to work with you to find exactly what you need. Many modern metal shops depend on Wyandotte Service—for quick, sure action. Why not call your Wyandotte Service Representative *now!*

THE J·B·FORD SALES CO·
WYANDOTTE MICHIGAN
SERVICE REPRESENTATIVES IN 88 CITIES

Methods of permitting price fixing under the industrial mobilization plan and of assuring efficient operation of industry in war production are said to be under consideration. Congressional action would be necessary to put in effect any plans in this direction.

Tying in with the industrial mobilization plan would be measures for protecting domestic financial markets and the coordination of transportation, labor and electric power facilities. In the field of finance the Treasury is concerned with regulating foreign exchange and means of floating loans in order to provide as much stabilization as possible of the dollar as related to foreign currencies in the hope of keeping markets open as far as possible despite the European situation. The Navy and the Army have stepped up their programs, the Navy yards being put on a 24-hr. basis, while Army orders for requirements are reported to be considerably expedited. In its report to the President the board is said to have discussed the $100,000,000 purchase program for strategic metals including manganese, chromium, tungsten ore and tin. Congress authorized this sum to be spent under a four-year period but approximated only $10,000,000 for the current fiscal year.

Two Plans Prepared

Two industrial plans have been prepared. One would apply in the event of war in which the United States would not be a participant and the other would be effective if the United States became a belligerent. It was stated that a fundamental consideration respecting control of prices looks to the avoidance of any intended dislocation of the domestic economic structure if heavy production demands are made on industry.

The Social Security Board has informed the WRB that 30,157,694 persons were employed in 1937 in industries covered by the Social Security system. Mr. Stettinius, according to the Social Security Board, had asked information on ages and occupational opposition of the country's industrial population.

The immense task of industrial mobilization is realized as one which will require considerable time. The scope of preparations can be gathered from the fact that between 15,000 and 18,000 plants have been listed and from them 9000 to 10,000 have been selected as key plants, which according to plans, could be readily transformed into war production. In order to prepare plants for war production $16,000,000 was approximated for the placing of additional orders to lay the foundation for rapid procurement of essential items of equipment of a more commercial nature. The WRB would supervise production, schedules, distribution of raw materials and the problem of labor supply.

Six Months to Mobilize

So thoroughly have steel plants been surveyed, that the government knows where every ton of its war-time steel is coming from. As stated in THE IRON AGE of Jan. 5, 1938, it has been estimated that it would take about six months to mobilize steel mill facilities to meet war demands and at the same time be prepared to serve domestic requirements. As war continued and heavier drains were made on the industry, manifestly it might be necessary to create additional capacity. The industry today is vastly better prepared both from the point of capacity and technological developments to serve war demands than it was during the World War.

The question of financing private industry in the event of a European war was discussed with President Roosevelt last Thursday by Jesse H. Jones, Federal Lending Administrator. He said there would be no lack of credit in this country. He expressed the view that he did not believe the Export-Import bank would extend credit to foreign governments for the purchase of raw materials although it might have the technical right to do so.

He said both the bank and the RFC were not subject to the Johnson Act and barring credit to the United States for defaulting on war debts to the United States. Mr. Jones made it clear that under no circumstances would the Export-Import bank underwrite the exportation of war materials. It was indicated by Mr. Jones that the bank's operations probably would be confined to agricultural surpluses as in the past but that manufactured products other than war materials also would be eligible for federal export financing.

Armco Preferred Dividend

AMERICAN ROLLING MILL CO. has declared a dividend of $1.25 per share on account of dividends in arrears upon the 4½ per cent cumulative Preferred Stock, payable Oct. 16, 1939, to stockholders of record at the close of business on Sept. 15, 1939.

Battleship Steel Contracts Are Awarded

WASHINGTON—Recent contracts awarded by the Navy Department for steel for the two 45,000-ton battleships under construction at the Brooklyn and the Philadelphia Navy yards include the following: Thomas Gregory Galvanizing Works, 200 tons galvanized I-beams; Worth Steel Co., 1250 tons and Jones & Laughlin Steel Corp., 2500 tons plates, sheets and strips; Ross Galvanizing Works, 430 tons galvanized plates, sheets and strips; Phoenix Iron Co., 2250 and Bethlehem Steel Co., 100 tons shapes; Ross Galvanizing Works, 250 tons and Enterprise Works, 30 tons galvanized shapes.

ICC Approves New 85c. Water-Rail Rate

WASHINGTON—The Interstate Commerce Commission has authorized a water-rail route of 85c. per 100-lb. on iron and steel products from New York and Brooklyn and Hoboken, N. J. to El Paso, Tex. The rate was approved pending the commission's action on a long-and-short haul application to establish rates on iron and steel products from North Atlantic ports by way of Texas or Louisiana Gulf ports to El Paso.

Air Bases Awarded

WASHINGTON—The Navy Department has awarded contracts amounting to $12,739,000 for the construction of air bases at Kodiak and Sitka in Alaska to the Siems Spokane Co., Spokance, Wash., Johnson, Drake & Piper, Inc., Minneapolis, and the Pudget Sound Bridge & Dredging Co., Seattle. As reported in THE IRON AGE for Aug. 31, page 51, the architectural engineering contract for all air bases authorized by Congress last session had previously been awarded Albert Kahn, Inc., Detroit.

Navy Awards Cable Contracts

WASHINGTON—The Navy Department's Bureau of Yards and Docks has awarded contracts for cable to these companies: John A. Roebling's Sons Co., Trenton, N. J., $32,196; General Electric Co., Schenectady, N. Y., $33,515; Boston Insulated Wire & Cable Co., Boston, $30,705; National Electric Products Corp., Pittsburgh, $94,835; American Steel & Wire Co., of New Jersey, $210,182; Habirshaw Cable & Wire Division, Phelps Dodge Copper Products Corp., New York City, $64,452.

Picture of a Parasite...

The lowly toadstool is not unattractive—yet it is a parasite. Upon careful analysis its existence is difficult to justify. ¶ Toadstools of a kind will be found in many industrial plants today. For the most part they may not be unattractive for they are mechanically in good condition. Unless the situation is carefully analyzed they may seem to completely justify their existence. But do they? ¶ The toadstools we are referring to are obsolete machine tools; specifically, obsolete grinding machines. Even though they may be in perfect mechanical condition, the recent advances in design and productiveness have been so marked that the continued use of old equipment makes profits impossible in the face of competition. ¶ A well known valve manufacturer recently installed two Landis 6" x 18" Type C Plain Hydraulic Grinders. He found that they produced better work than he had gotten before, but more important, that his production was increased 100%. If he were still using his older machines, how could they be termed anything else but parasites? ¶ Investigate your own grinding department and make certain that every machine in it is contributing to, not eating, profits. 307

LANDIS TOOL COMPANY

WAYNESBORO, PENNA.

PRECISION LANDIS GRINDERS

INVEST IN LANDIS

Business Floods Treasury With Offers to Cooperate on Taxes

WASHINGTON — Discussing the role of taxation in economic recovery, Acting Secretary of the Treasury John W. Hanes, in an address on the National Radio Forum last week, said a flood of communications pledging active support had been received in response to his invitation to almost 1000 leaders in industry, labor, commerce, banking, agriculture and the professions to cooperate with the Treasury and a subcommittee of the House Committee on Ways and Means in making a thorough study of internal revenue taxation during the Congressional recess.

Mr. Hanes pointed out that he has offered these leaders a private hearing before the Treasury staff assigned to compile a record of public tax opinions and has arranged for complete transcripts of the hearings to be presented to the House subcommittee on Nov. 1.

"I need hardly say that only with the help of those active in the economic life of our country can we develop the revenue system this country needs," said Mr. Hanes. "I hope that those among you who have an interest in taxation and a thought to contribute, will feel free to communicate with me. I'll appreciate the help you can give."

Mr. Hanes said that no purpose is served when groups of taxpayers strive only for the reduction of their share of the cost of government.

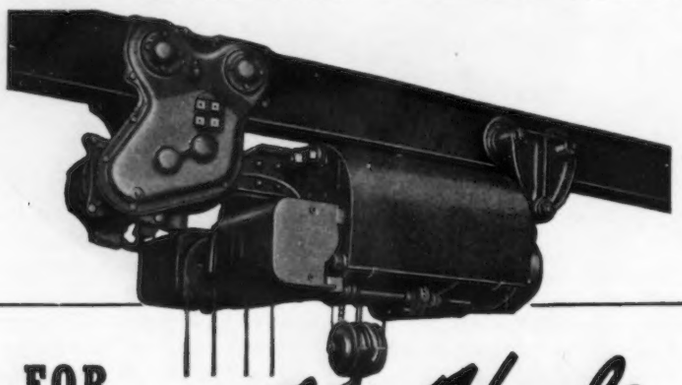
"A balanced division of responsibility is possible, however, when all interested taxpayers look upon the Federal Government as their own business and consider tax revision in the light of the general public interest," he added.

Speaking of new provisions of the Revenue Act of 1939, giving relief to business, Mr. Hanes said these measures, together with some he did not mention, will collectively go a long way in contributing to economic recovery. He submitted economic indices to support his statement that there are indications that further recovery is under way.

Taxes and other issues which are of vital economic concern during peace times obviously would be shunted to the background, if indeed taxes were not further increased in the event of war or intensified preparations for hostilities.

Taxes 22 Per Cent of Income

The possibility of actual tax reduction, as distinguished from a more equitable distribution of the tax burden, is not bright under existing conditions wherein government expenditures continue to greatly exceed revenue. The enormous tax load is well illustrated by recent Treasury figures. They show that Federal, state and local tax collections in 1938 absorbed almost 22 per cent of the estimated annual income and amounted to $114.09 for every man, woman and child in the United States. These collections have increased by 80 per cent since 1932, or in six years. Even with these heavy taxes, with their deterring effect on business, large deficits have piled up one on another. In 1938 the tax collections of the Federal, state and local units, amounting to $14,811,000,000 were $2,659,000,000 short of expenditures and debt retirement funds, amounting to $17,470,000,000.



FOR *Long Fast Hauls* use a MOTOR TROLLEY TYPE A-E-CO LO-HED HOIST

When—1. The haul is long, regardless of weight of load. 2. The operation is frequently repeated. 3. The path under hoist is obstructed. 4. Speed is an important factor—

The *motor trolley type* A-E-CO Lo-Hed Hoist should be used—It is driven by a separate motor and controlled from the floor.

For high-lights of this hoist see A-E-CO POINTS (below). For full details of Lo-Hed hoists, send for our new catalog today.

A-E-CO POINTS

- Lo-Heds range from ¼ to 12 ton capacities (above type available from ½ to 12 tons).
- Operates on Standard I-beam or track of any make.
- Low headroom—stacks materials higher than any other hoist.
- Safe, fool-proof.
- Compact, strong, simply constructed.
- Protected against dust, moisture, fumes.
- Heavy duty, ball-bearing HOIST SERVICE motors.
- Automatic lowering brake.
- Ball or roller bearings at vital points.
- Improved plow-steel cable.
- 100% positive automatic stop.
- Efficient spur-gear drive . . . and

LO-HED COSTS LESS PER LIFT

OTHER A-E-CO PRODUCTS: Taylor Stokers, Marine Deck Auxiliaries, Hele-Shaw Fluid Power.

A-E-CO Lo-Hed HOISTS

AMERICAN ENGINEERING COMPANY

2410 ARAMINGO AVENUE, PHILADELPHIA, PA.

Taxes and Scrap Competition Threaten to Bring More "Ghost Towns" to Iron Ranges in Minnesota

SALT LAKE CITY—Harsh taxation and competitive conditions with aluminum, scrap iron and steel and with iron ores from other fields are causing a slow but steady decline in Minnesota's position as a producer of raw material for the steel industry.

This picture of the diminishing importance of Minnesota as a feeder of the blast furnace was presented to the sixth annual metal mining convention and exposition of the American Mining Congress in a paper prepared by O. A. Sundness, chief engineer of the Snyder Mining Co., Chisholm, Minn. The conditions recited were said to have resulted in inability to operate most of the underground mines on the Mesaba and Cuyuna ranges.

By charts, Mr. Sundness' paper, read for him in his absence, showed that in the pre-war period, 1906-1914, the metallic content of Minnesota ores shipped was approximately 47 per cent of the total tonnage of steel produced in the United States. At present, it was declared, Minnesota is having difficulty in maintaining a 33 per cent position. During the depression it was said to have dropped as low as 26.7 per cent. The total tonnage of iron ore remaining in northern Minnesota was said to be about 1,230,000,000 tons, and Minnesota Tax Commission records, Mr. Sundness stated, indicate that 1,148,000,000 have been shipped.

"For the people of the state of Minnesota, where many of the communities derive over 95 per cent of their tax income from these potential but vanishing values of iron ore, where the state has had its financial burden eased to the extent of $498,000,000 by income from these same ores, the economic study of their iron ore heritage should be a most important subject," said Mr. Sundness. "Constructive thought and action in the mining communities themselves, and intelligent, foresighted policies developed by the state, may still avert a situation similar to that now existing in the eastern coal fields and may help to restore, at least, partially, the markets for Minnesota iron ore."

In northern Minnesota, it was pointed out, many fine communities have been erected and maintained from iron ore values. Through 1938, Mr. Sundness said, $277,729,934 had been diverted for the purpose of local governmental expense. Through the same year counties were said to have received $75,988,681, while the state of Minnesota, through its ad valorem tax, occupation tax and royalty tax, had benefited to the extent of $104,653,978. Also supplementing the tax income to the state, it was explained, are the royalty payments on state-owned mines. This distribution from the ore values was said to have been $39,924,447 through 1938, making a total of $498,000,000 drawn by the state and its subdivisions from these ore values. In addition, Mr. Sundness said, the Federal Government has benefited handsomely in its collection of income tax, corporation tax, war profits tax, surplus tax, social security tax, and others.

The iron ranges of Minnesota, Mr. Sundness stated, are not without their "ghost towns" because of competitive conditions and high taxes. He said that by reason of low grade ores in some cases, because of high costs, high taxes, as well as a multiplicity of taxes, and high royalties, underground ores on the Mesaba and Cuyuna ranges can not be brought to a market and show a profit. Hence, he declared, the ore is valueless, the mine is inoperative, the payrolls are destroyed, and the town without its industry is in its ghost stage.

"The most serious competitor of Minnesota iron ore has been scrap iron and scrap steel," said Mr. Sundness. From the standpoint of conservation of natural resources, the use of these materials is of a great economic benefit to the United States. However, the lack of a proper knowledge, and the lack of a sound understanding of the extent to which this scrap affects the potential values of Minnesota ores is general, and therefore detrimental to the best interests of the iron mining communities, and to the state itself."

Charts were presented to illustrate the rise in scrap consumption contemporaneously with the decline in ore shipments. During the five-year period 1906-1910 scrap consumption was said to have been 3,700,000 tons. Comparing this with two boom periods, 1918 and 1927, Mr. Sundness said an average of 15,300,000 tons of scrap was consumed in the 1918 period, an increase of more than 313 per cent and an average of 23,600,000 tons consumed during the 1927 period, an increase of nearly 537 per cent over the 1908 period.

"During the last five-year period, we find scrap consumption averaging 20.8 million tons, which is still an increase of approximately 462 per cent

World War Depleted Manganese, Chrome Ores

ALTHOUGH the strategic position of the United States has been eased with respect to supplies of nitrates, potash, platinum, molybdenum, vanadium, pyrite, sulphur, and antimony, the rapid increase in the use of alloys has made this country more dependent than ever on foreign sources for manganese, chromium and nickel. The situation has been further aggravated by the depletion of the very limited high-grade reserves of manganese and chrome ores during the last war and, in the case of nickel, by the transfer of refining operations from this country to Canada.

This was reported by Dr. John W. Finch, director of the Bureau of Mines, to the recent Mining Congress at Salt Lake City.

over the 1908 period," said Mr. Sundness. "In these same periods the metallic content of Minnesota ore shipments increased 55.4 per cent, 51.0 per cent, and lost .7 per cent, respectively."

Half Is Reworked Metal

To emphasize the growing importance of scrap in the steel industry in the United States, Mr. Sundness said that today more than 50 per cent of the domestic steel comes from reworked old metal. Approximately 95 per cent of the finished steel was said to come from the open hearth process, which is able to consume large percentages of scrap and may even run on 100 per cent scrap. It was stated that it is this basic change in the metallurgy of steel that accounts for the reduction in iron ore consumption and its replacement by scrap.

Two reasons were given for the belief that instead of an exhaustion of the scrap supply soon it will be extended while iron ores will be pushed still farther out of the picture. One was the advancement in metallurgy, particularly in the alloy fields, which have brought about changes and improvements in the strength of the product until now a steel member of one-half the cross-section that was formerly used meets the required design. The other reason given was that the properties of alloys are such that they resist corrosion and wear to such an extent that their life is appreciably extended.

An Ever-Revolving Commodity

Mr. Sundness said that prominent men in the scrap industry predict that steel will some day be an ever revolving commodity, "and then we will never have to think about iron ore reserves again." This prophecy, it was declared, may or may not come to pass, but it was pointed out that the increased use of 17,000,000 tons of scrap in the last 30 years displaces 34,000,000 tons of iron ore, or the curtailment of Minnesota ore production of 20,000,000 tons annually, which was said to be enough to establish prosperity on Minnesota iron ranges again.

Mr. Sundness said that the solution of the problem is the price of iron ore, "which of course is governed by the total of all of the costs such as taxes, royalty production and marketing."

Analyzing the effect ore price increases would have in the way of opening further the market for scrap, Mr. Sundness said:

"It is evident, therefore, that any increase in the price of Minnesota ore is detrimental to production, in so far as it only invites scrap competition from a new and extended area. Conversely, a reduction in price and cost should be a beneficial stimulant to ore production and to additional mining employment."

Confirmation From the A.F.L.

ON a visit to the Glass Center exhibit at the World's Fair yesterday, Harry H. Cook, international first vice president of the American Flint Glass Workers Union of this nation and Canada, said the glass industry today offered the highest percentage of employment of any basic industry. The machinery advance, he said, has aided rather than retarded its employment.—From the New York Times, Aug. 25.

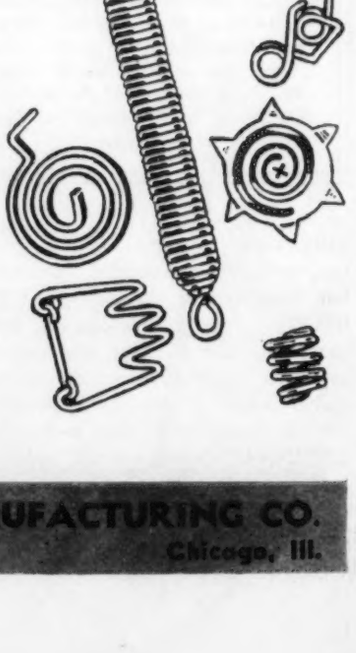
ACCURATE
is the name for
SPRINGS you
can depend* upon!

*you can depend on delivery when you want them . . .

*you can depend on performance when you get them . . .

IT means a lot to us — that reputation we have for dependability. We want to impress upon you these two facts: the finest springs in the world can't do you any good if they aren't in your plant when you need them, and good delivery service on springs means nothing if you can't depend on their quality.

Accurate means service and quality in springs — you can depend on that. If you haven't already found it out — let us quote on your requirements. You'll be glad.



ACCURATE SPRING MANUFACTURING CO.
3811 West Lake Street Chicago, Ill.

. . . PERSONALS . . .

CHARLES L. HUSTON, JR., who has been assistant staff supervisor of employment at the Middletown, Ohio, plant of the American Rolling Mill Co., has resigned to join Lukens Steel Co., Coatesville, Pa., as director of personnel of Lukens and its divisions, By-Products Steel Corp. and Lukenweld, Inc. Mr. Huston was graduated from Princeton University in 1928 and spent the following year on special studies in metallurgy at Massachusetts Institute of Technology. He joined the American Rolling Mill Co. in 1929, spending five years in the metallurgical and operating departments, followed by five years on the personal relations staff.

❖ ❖ ❖

NEIL CURRIE, JR., heretofore manager of the Fort Wayne, Ind., works of General Electric Co., Schenectady, N. Y., has been appointed assistant to W. R. BURROWS, vice-president in charge of manufacturing. MANLY E. LORD, who has been in charge of reduction work in all manufacturing divisions of the company, succeeds Mr. Currie at Fort Wayne.

Mr. Currie became identified with the company in 1908 in the power apparatus department, following his graduation from the University of Minnesota. In 1911 he was named assistant engineer of the power motor engineering department. Nine years later he was named engineer of that department and in 1925 managing engineer. He was made manager of the company's Philadelphia works in 1929 and in 1936 he was appointed manager of the Fort Wayne works.

Mr. Lord has also been with General Electric since 1908. While still a student at Newark Technical School, he entered the incandescent lamp department and worked up to the position of assistant superintendent in charge of production at Newark. In 1917 he went to the Edison Lamp works in charge of general production, and three years later became a member of the general staff on special assignments. In 1928 he was transferred to the Schenectady manufacturing department and the following year was put on special production work. He was given charge of the waste and spoilage section of the Schenectady works in 1930, later becoming a member of the staff of W. R. Burrows as secretary of the manufacturing committee. Mr. Lord was named coordinator of all refrigerator manufacture, serving in that capacity until July of this year, when he was assigned to cost reduction work in all manufacturing divisions of the company.

CHARLES L. HOUSTON, JR.

❖ ❖ ❖

ROY E. SMITH, manager of the Chicago division of the W. Q. O'Neall Co., Springfield, Ill., subsidiary of the American Rolling Mill Co., has been appointed general manager of the company. He joined the company in 1928 as sales engineer. The following year he was made promotional engineer and was advanced to Illinois division manager in 1931 and became Chicago division manager in 1933.

❖ ❖ ❖

E. V. MORROW, heretofore treasurer of the Neveroil Bearing Co., Wakefield, Mass., has been appointed general manager, succeeding R. H. OSBORN, who has resigned because of ill health.

❖ ❖ ❖

GEORGE W. SWEENY, who has been assistant secretary of the H. C. Frick Coke Co., Pittsburgh, has been appointed assistant to the president in charge of finance. He was secretary-treasurer of the United States Fuel Co., Chicago, for many years, and has been associated with United States Steel subsidiaries since 1908. GEORGE M. THURSBY, formerly casualty manager, succeeds Mr. Sweeny as assistant secretary of the Frick companies.

❖ ❖ ❖

CYRUS L. PHILIPP, president, Union Refrigerator Transit Co., Milwaukee, has been elected a trustee of the Northwestern Mutual Life Insurance Co., Milwaukee. Mr. Philipp is vice-president and director of the General American Transportation Corp., of which the Union Refrigerator Co. is a subsidiary.

❖ ❖ ❖

WILFRED S. MCKEON has been elected president of the Century Fittings Co., Greensburg, Pa., succeeding the late William J. Burkart, founder.

❖ ❖ ❖

E. J. LOWRY, formerly of Hickman, Williams & Co., has returned from Russia, where he was retained for eight years as chief metallurgist of heavy industries. He has become associated with the Woonsocket Color & Chemical Co., Woonsocket, R. I. He has spent the past year in Europe and has acted as consultant in the iron and steel industry.

❖ ❖ ❖

C. T. PRICE, heretofore vice-president in charge of sales of Compressed Industrial Gases, Inc., Chicago, has been made vice-president and general manager of the company. F. M. WYMAN has been appointed general sales manager and R. G. WILSON, assistant general sales manager.

❖ ❖ ❖

J. F. BEKOLA, formerly of the metallurgical department of the Warren, Ohio, plant of Republic Steel Corp., has been placed in charge of the metallurgical department of the Thomas Steel Co., Warren, Ohio.

❖ ❖ ❖

GEORGE B. COMFORT, who has been associated with Schramm, Inc., West Chester, Pa., since 1924, has been appointed manager of sales promotion. At first he served in the capacity of factory manager and more recently as manager of engineering sales.

JOSEPH E. MCGROGAN, who has been with the company since 1918, has been made manager of the Schramm department of Equipment Rental Co.

❖ ❖ ❖

GLADYS V. CORBETT, advertising manager of the Driver-Harris Co.,

Good springs are not necessarily expensive. Savings in ultimate use often more than pay for the very slight difference between just a spring—and the right spring. If your springs have been "acting up," Gibson engineers may have the answer. They are always ready for consultation—or for estimates.

Send your specifications to

WILLIAM D. GIBSON CO.

DIVISION OF ASSOCIATED SPRING CORP. 1800 CLYBOURN AVE., CHICAGO, ILL.

SPRINGS • WIREFORMS • SMALL STAMPINGS

Do it today!
If you don't know about the exceptional forming qualities of Superior Tite and Extra Tite coat sheets—
Investigate now!
They are ideal sheets for tanks, elbows, beaded mouldings, etc.
THE SUPERIOR SHEET STEEL CO. CANTON, O.
TRADE MARK REGISTERED
SUPERIOR
THE SUPERIOR SHEET STEEL CO.
CANTON, OHIO
Division of Continental Steel Corp., U. S. A.
OPEN HEARTH STEEL SHEETS
• Superior Galvannealed, "Super-Metal", Galvanized, Long ternes, Special Coated . . . Hot rolled, Cold rolled.

Harrison, N. J., has been appointed chairman of the Ladies Entertainment Committee for the National Industrial Advertisers Association Conference to be held in New York, Sept. 20 to 22.

❖ ❖ ❖

GEORGE W. SWEENY has been appointed assistant to president in charge of finance, according to an announcement made by Harry M. Moses, president, H. C. Frick Coke Co. and other coal producing subsidiaries of the U. S. Steel Corp. Mr. Sweeny, for many years secretary-treasurer of the U. S. Fuel Co. of Chicago and recently assistant secretary of the Frick companies, has been associated with U. S. Steel subsidiaries since 1908.

GEORGE M. THURSBY, formerly casualty manager, succeeds Mr. Sweeny as assistant secretary, and E. W. RUCH succeeds Mr. Thursby.

Union Carbide & Carbon Absorbs Bakelite Corp.

UNION CARBIDE & CARBON CORP. has approved an agreement for the acquisition by Carbide of all the assets of Bakelite Corp. Carbide is a producer of chemical raw materials and Bakelite a user of chemicals in its converting activities.

Bakelite has been active in the manufacture and distribution of thermosetting plastics, principally of phenolic types. Over a quarter century ago Dr. L. H. Baekeland made his discovery which gave to the world a new material. This he called "Bakelite" plastic. During the intervening period products from this material have included telephone receivers, automobile ignition parts, timing gears, radio cabinets, electric insulators, switch plates, bottle caps, lamp bases, pencils, buttons and novelties.

G-E Publishes Welding Manual

A POCKET-SIZE, illustrated arc welding manual containing more than 200 pages is being published by the General Electric Co., Schenectady. Sections are devoted to the technique of arc welding, practical applications, automatic arc welding and atomic hydrogen welding. A training course for operators comprises some 15 illustrated lessons, and there is an appendix which includes a number of useful tables and a handy estimator for determining arc welding electrode quantities. The price of the manual, which is spirally bound, is $1.00.

. . . OBITUARY . . .

CHARLES BARNDT, 63, vice-president and general manager of the former Hamilton Metalplane Co., Milwaukee, was killed in an automobile accident in Cleveland on Aug. 27. Before moving to Cleveland Heights, Cleveland suburb, Mr. Barndt had been a leader in the post-war development of the airplane. The Hamilton plane manufactured here in the early twenties, was one of the first successful all-metal planes. Following the company's affiliation with the United Aircraft & Transport Corp., manufacture of the plane was discontinued in Milwaukee, with Mr. Barndt resigning. At his death he was vice-president in charge of operations of the Aviation Mfg. Co., Williamsport, Pa. He had recently interested a group of New York bankers in establishing a firm to manufacture variable pitch propellers of a reputedly revolutionary design. Barndt was also at one time president of the Racine Mfg. Co., Racine, Wis., which made bodies for Nash and other automobiles. Prior to that he was president of the Stearns Automobile Co. He was 63 years old.

❖ ❖ ❖

EDWARD J. CONNOLLY, president of the Hayes Body Corp., Grand Rapids, Mich., died Aug. 20 when he was stricken with a heart attack while playing in a tournament golf match near Grand Rapids. He was 48 years old. Mr. Connolly was elected to the board of directors of Hayes Body Corp. in 1929 and served as vice-president for several years before he was named president last May.

❖ ❖ ❖

EDWIN HEWITT BROWN, 60 years old a director of the Bohn Aluminum & Brass Corp. and former vice-president and treasurer of the General Aluminum & Brass Mfg. Co., was buried Aug. 19 after services at Grosse Pointe, Mich. Burial was in Cleveland. Mr. Brown was graduated from Yale University in 1901.

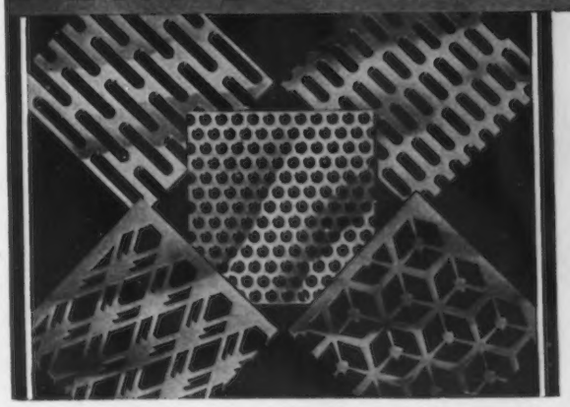
❖ ❖ ❖

JOHN MILLER, JR., 67, for 50 years associated with the Charles H. Besly & Co., Beloit, Wis., died at a Chicago hospital Aug. 21, following an extended illness. He joined the firm as a youth of 17, and at his death was general superintendent.

❖ ❖ ❖

JOHN R. HOUSTON, 53, chemist at the Carnegie-Illinois Steel Co., Chicago, died of a heart attack Aug. 21 while at work. He had been a resi-

PERFORATED METALS



• INDUSTRIAL AND ORNAMENTAL •

ANY METAL

ANY PERFORATION

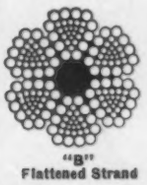
•

• Making holes is our entire business and we've made billions and billions of them—little ones, big ones, round, square, oblong and slot holes besides shapely ones in many beautiful designs. Our service is at your command.

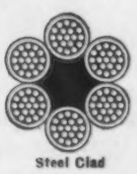
The Harrington & King PERFORATING Co.

5657 FILLMORE ST., CHICAGO — 114 LIBERTY ST., NEW YORK

Style B Flattened Strand


"B" Flattened Strand

Wire Rope Center


Steel Clad

You Can Depend On "HERCULES"* (Red-Strand) Wire Rope...

There is no guesswork when you use "HERCULES" (Red-Strand) Wire Rope. It is designed and built to do specific jobs better . . . safer . . . more economically. Furnished in a wide variety of constructions so as to be suitable for all purposes—each backed by 81 years of manufacturing experience and close cooperation with users.

—PREFORMED—

For maximum efficiency in Preformed Wire Rope, use Preformed "HERCULES". It is available in both Round Strand and Flattened Strand constructions.

Made Only By

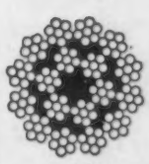
A. LESCHEN & SONS ROPE CO.

Established 1857

5909 KENNERLY AVENUE, ST. LOUIS, MO.

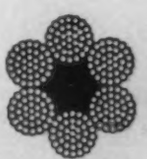
New York . . . . 90 West Street
Chicago . 810 W. Washington Blvd
Denver . . . . 1554 Wazee Street
San Francisco . 520 Fourth Street
Portland . 914 N. W. 14th Avenue
Seattle . 2244 First Avenue South

* Reg. U. S. Pat. Off.


18x7 Non-Rotating

6x19 Filler Wire

6x19 Seale


6x37 Extra Flexible

8x19 Extra Flexible

dent of Milwaukee, Wis., for 27 years before leaving for Chicago several years ago. For nine years he was chemist at the Harnischfeger Corp., in Milwaukee.

❖ ❖ ❖

LORAN J. HARVEY, general foreman of the West Lynn, Mass., plant of the General Electric Co. for 39 years died at his home in Swampscott, Mass., on Aug. 24. He served in the Spanish War in Cuba as lieutenant.

❖ ❖ ❖

LAWRENCE J. BRADFORD, treasurer of the Lunkenheimer Co., Cincinnati, died suddenly in his home at Cincinnati, Aug. 21. He was 54 years old.

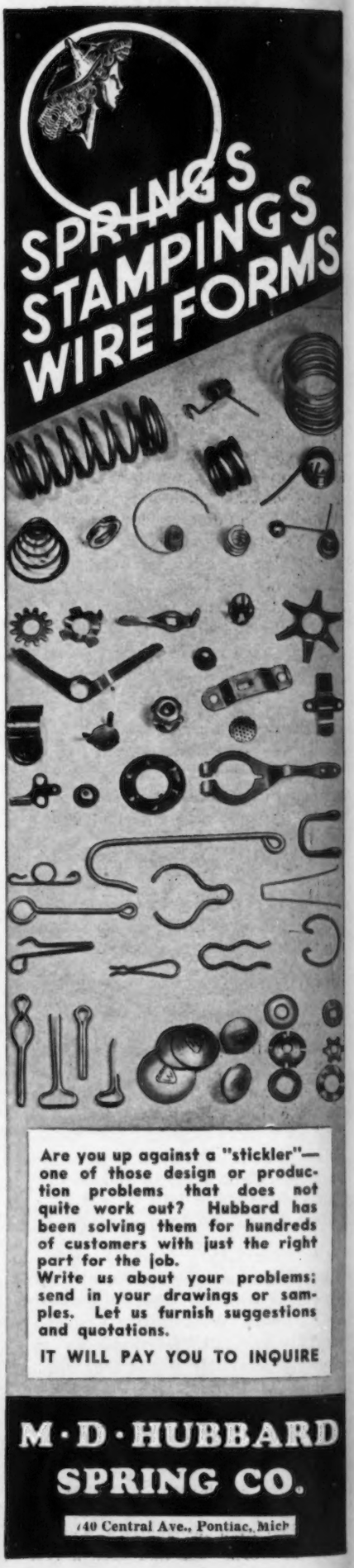
Steel Framing Gets Test in Detroit Housing

STEEL framing may be used in Federal housing projects in Detroit as a result of action taken last week. Detroit's Housing Commission, advocating that steel firms be given a chance to prove their contention that projects here could be erected of steel more cheaply than with reinforced concrete, finally succeeded in wearing down opposition of the United States Housing Authority to alternate plans for a new project here. Commissioner Charles H. Awkerman, president of the Parker-Wolverine Co., rustproofing concern, has been a proponent of the use of steel instead of reinforced concrete.

Pig Iron Output at 8-Year High in France

THE production of pig iron in France during July amounted to 732,000 metric tons, compared with 719,000 metric tons in June and only 443,000 tons in July, 1938. The July total is the highest recorded since 1931. French steel output during July was 745,000 tons, against 763,000 tons in June and 436,000 tons in the previous July. The seven months' total for pig iron is 4,777,000 tons, against 3,610,000 tons for the corresponding period of 1938, and for steel it is 4,707,000 tons, against 3,664,000 tons.

The improvement in the Belgian steel industry continues, the July output being 291,120 tons, against 179,788 tons in July, 1938. For the seven months the total output was 1,690,880 tons, against 1,228,690 tons. Pig iron production in July was 295,010 tons, against 198,500 tons in June and for the seven months it was 1,730,530 tons, compared with 1,401,440 tons.


SPRINGS
STAMPINGS
WIRE FORMS
Are you up against a "stickler"—one of those design or production problems that does not quite work out? Hubbard has been solving them for hundreds of customers with just the right part for the job.
Write us about your problems; send in your drawings or samples. Let us furnish suggestions and quotations.
IT WILL PAY YOU TO INQUIRE
M·D·HUBBARD
SPRING CO.
140 Central Ave., Pontiac, Mich

Carnegie-Illinois Consolidates Irvin, Vandergrift Plants

PITTSBURGH—Effective Sept. 1, the Vandergrift works of Carnegie-Illinois Steel Corp. will be consolidated with and operated under the direction of the company's Irvin works and will be known as the Vandegrift plant of the Irvin works. H. G. McIlvried remains general superintendent of the Irvin works and L. S. Dahl likewise continues as assistant general superintendent, while John H. Elliott continues as assistant to the general superintendent. D. G. Buchanan, who has been general superintendent of the Vandergrift works, becomes assistant to the general superintendent of the Irvin works. F. J. Christie, who has been assistant general superintendent of the Vandergrift works, becomes superintendent, Vandergrift plant.

The Vandergrift plant, which produces specialty steels, was part of the American Sheet & Tin Plate Co. before the latter was absorbed by Carnegie-Illinois Steel Corp.

952 Employees Honored By Acme Steel Co.

CHICAGO—The Acme Steel Co., which has made a profit in each of its 60 years of existence, last week presented service awards to 952 employees. R. H. Norton, president, who has himself been associated with the company for 35 years, presided at the award meetings, held at the Archer Avenue, Chicago, and Riverdale, Ill., plants, and awarded watches and emblems to the veterans.

Of its present 2300 employees, 952 or 40 per cent have been with the company for 10 years or more. Of this number, 274 have 15 years of service, 49, 20 years, and 20, 25 years or more.

Moline Company to Build Rockford Drilling Machines

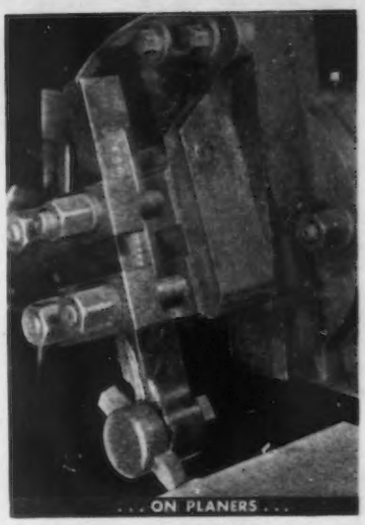
MANUFACTURE and sale of the special high-production drilling, boring and tapping machines heretofore built by the Rockford Drilling Machine division of the Borg-Warner Corp., Rockford, Ill., has been taken over by the Moline Tool Co., Moline, Ill., builders of "Hole Hog" drilling, boring and honing machines. It is also announced that the Rockford machines will be built at the Moline plant.

ARMSTRONG

Use

ARMSTRONG TOOL HOLDERS

to speed up every operation



More pieces per hour mean lower cost per piece, less overhead and more profit.

"Standard" cutting speeds used in most shops have been carried over from the old forged tool days, have no relationship or reason for today's modern cutting steels, modern machine tools or modern ARMSTRONG TOOL HOLDERS. Today with efficient multi-purpose drop-forged ARMSTRONG TOOL HOLDERS for every operation, correct in cutting angle, accurate in proportion and shape, and strong beyond any possible need, speeds and feeds are limited only by the capacity of the machine tool. There is a lot of extra capacity and extra profit dormant in your shop for want of the correct ARMSTRONG TOOL HOLDERS. Each ARMSTRONG TOOL HOLDER is a permanent multi-purpose tool, that does the work of a complete set of forged tools. Each can be picked up anytime from stock at the nearest mill supply house, that "Saves: All Forging, 70% Grinding and 90% High Speed Steel" day after day, year in and year out.

Equip with ARMSTRONG TOOL HOLDERS *all the way*, speed up and profit.

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

309 N. Francisco Ave., Chicago, U. S. A.

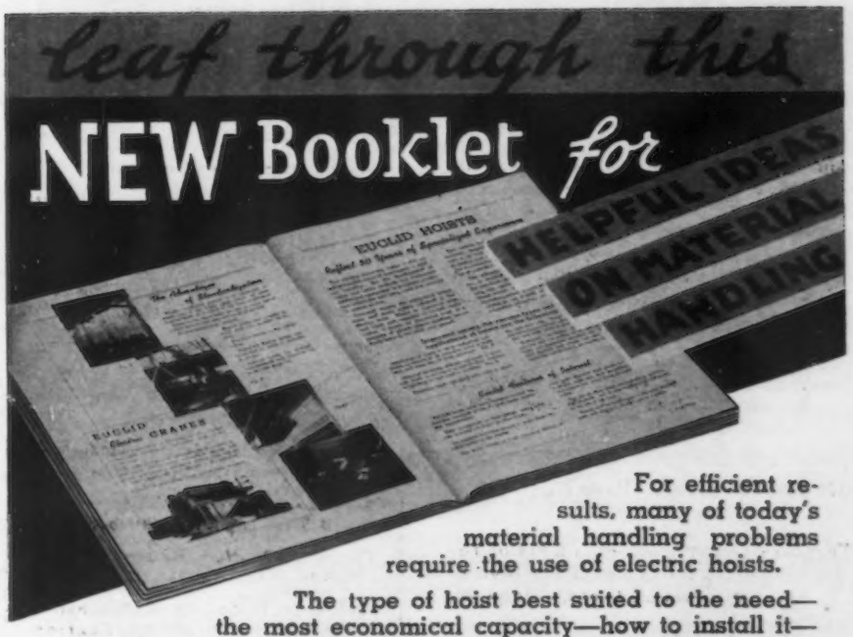
Eastern Warehouse and Sales: 199 Lafayette St., New York
SAN FRANCISCO LONDON

Buy ARMSTRONG TOOLS from your Supply House

ARMSTRONG TOOL HOLDERS Are Used in Over 96% of the Machine Shops and Tool Rooms

Leaf through this

NEW Booklet *for*



For efficient results, many of today's material handling problems require the use of electric hoists.

The type of hoist best suited to the need—the most economical capacity—how to install it—the kind of control most satisfactory and other related questions always present themselves when new equipment is considered.

These and other questions are answered in an interesting and helpful way in this condensed, well illustrated booklet.

Write for a copy today.

The EUCLID CRANE & HOIST Co.
1361 CHARDON RD. EUCLID, O.

EUCLID CRANES & HOISTS

. . . THE NEWS IN BRIEF . . .

War in central Europe affects truck exports; Detroit sees increased buying from neutrals; automotive employment rises despite labor troubles.—**Page 56.**

Large nickel plating plant is completed.—**Page 58.**

Weirton orders steam turbine unit from Allis-Chalmers.—**Page 59.**

William A. Ross succeeds Ambrose N. Diehl as president of Columbia Steel Co.—**Page 59.**

Steel payrolls show 2000 more workers employed in July than in June.—**Page 59.**

Recent advances on use of coal will be discussed at Columbus meeting of mechanical, mining and metallurgical engineers.—**Page 59.**

President believes U. S. can avoid war; War Industries Board ready to mobilize industry, fix prices, use old war board's experience as guide.—**Page 60.**

American Rolling Mill Co. votes a $1.25 dividend on preferred stock arrearage.—**Page 64.**

Contracts for cable are distributed by Navy yards and docks bureau.—**Page 65.**

ICC authorizes new water-rail rate on steel shipped from New York to El Paso.—**Page 65.**

Navy awards contracts for steel to be used in two 45,000-ton battleships.—**Page 65.**

Air bases awarded.—Page 65.

Treasury Department gets flood of replies from business leaders invited to give views on taxes.—**Page 66.**

Scrap competition and high taxes threaten to bring more "ghost towns" to iron ranges of Minnesota.—**Page 67.**

General Electric publishes welding manual.—**Page 70.**

Union Carbide & Carbon Co. absorbs Bakelite Corp. by exchange of stock—**Page 70.**

Steel framing gets test in Detroit housing.—**Page 72.**

Pig iron output in France at 8-yr. high; steel production continues heavy.—**Page 72.**

Carnegie-Illinois consolidates Irvin, Vandergrift plants.—**Page 73.**

952 employees honored by Acme Steel Co.—**Page 73.**

Moline Tool Co. to build drilling machines for Borg-Warner Rockford division.—**Page 73.**

SECTIONS INDEX

Personals	69
Obituary	71
Current Metal Working Activity	80
Steel Ingot Production	81
Summary of the Week	82
Comparison of Prices	83
Pittsburgh, Chicago, Cleveland, Philadelphia and New York markets	84
Scrap Market and Prices	88
Finished Iron & Steel	90
Pig Iron & Raw Material Prices	92
Warehouse Prices	93
Fabricated Steel	94
Non-ferrous Market	95
Plant Expansion & Equipment	98
Machine Tool Activity	100

MEETINGS

Sept. 4 to 8—British-American Engineering Congress, New York.

Sept. 8 and 9—American Ceramic Society, Conneaut Lake, Pa.

Sept. 14 to 17—National Association of Foremen, Pittsburgh.

Sept. 20 to 22—National Industrial Advertisers Association, New York.

Sept. 26 to 29—Association of Iron and Steel Engineers, Pittsburgh.

Oct. 4 to 13—National Machine Tool Builders' Association, Cleveland.

Oct. 5 to 7—Society of Automotive Engineers, aircraft production meeting, Los Angeles.

Oct. 6 to 7—Foundry Equipment Manufacturers Association, White Sulphur Springs, W. Va.

Oct. 16—Society of Automotive Engineers, annual dinner, New York.

Oct. 16 to 20—National Safety Congress and Exposition, Atlantic City, N. J.

Oct. 23 to 27—National Metal Congress, Chicago.

Steel imports in July 27,516 tons against 30,050 tons in June.—**Page 78.**

Exports are 35 per cent of total business for Stran-Steel, light gage steel framing for houses, apartments.—**Page 78.**

Secretary Hopkins expected to recommend revisions making Wagner Act more palatable to industry.—**Page 79.**

NLRB rulings to "disestablish" unions do not mean "dissolution," law publication says.—**Page 79.**

Fansteel Metallurgical Corp. redeems its first mortgage and 6 per cent sinking fund gold bonds.—**Page 79.**

Twenty-five large companies in Toledo can produce supplies for Army and Navy, survey shows.—**Page 79.**

AFL loses another decision to CIO in NLRB ruling in Koppers Co. case.—**Page 79.**

Motor Coach division of Gar Wood Industries is sold to General American Transportation Co.—**Page 79.**

Carnegie-Illinois Steel Corp. obtains license for Standard Steel Spring Co.'s Corronizing nickel-plating process.—**Page 79.**

Canadian plants pushing ahead on war equipment manufacture.—**Page 80.**

Bethlehem workers attack NLRB. Weirton employees describe CIO as "communistically saturated."—**Page 80.**

More Machine Tool Congress programs listed.—**Page 96.**

Ireland opens new plant to fill country's entire needs.—**Page 99.**

J. & L. soon to have five converters equipped with Bessemer flame controls.—**Page 100.**

John L. Lewis finds New Deal is "callous" and "brutal," criticizes Administration for "thoughtless experimentation."—**Page 100.**

Scrap men pledge War Board support.—**Page 102.**

BRIGHT HARDENING LIKE THIS ISN'T MAGIC..

IT'S *Hydryzing!*

If you harden springs, stampings, or other small parts here's a really simple way to improve your product and save plenty of money doing it.

TAKE ADVANTAGE OF THIS OFFER

• Send us a batch of your parts today. We'll Hydryze and return them to you promptly. There is no obligation, and you can actually see for yourself what Hydryzing will do for your own products.

Have you often wondered how you could harden your springs, stampings, and other small parts without scale or discoloration? You can, and not only harden them without scale or discoloration, but harden them absolutely bright so that their original shiny surfaces are preserved intact.

Thus, you no longer need remove scale from hardened parts by means of pickling, sandblasting or other cleaning operations. Hydryzed parts look better because of their smooth, shiny surfaces, and take a smoother plating job because there are no pits due to scaling or subsequent cleaning operations. We'll be glad to Hydryze a batch of your parts to demonstrate the many savings possibilities of Hydryzing.

LINDBERG ENGINEERING CO.
228 No. Laflin St. Chicago, Ill.

LINDBERG FURNACES

HYDRYZING FOR HARDENING • CYCLONE FOR TEMPERING

War Finds Steel, Machin

STEEL manufacturing and metal working companies throughout the United States this week were attempting to appraise effects of the outbreak of war in Europe on business.

Industry's observers at Washington noted President Roosevelt's expression of belief that the U. S. can stay out of war and weighed the possibilities of quick repeal of legislation preventing shipping of war materials to foreign nations at war. Raw steel exports are not affected by the present Neutrality Act.

Already shipping difficulties in the Atlantic have multiplied the problems of exports of machinery, trucks and many steel products. Sharply higher war insurance rates have been accompanied by wage and insurance demands of the CIO's National Maritime Union.

At Cleveland unusual activity has already been noted on the part of ferromanganese users desiring to build up their inventories. Shortages were felt in ferromanganese in the first World war.

At Detroit automobile manufacturers were looking to South America and Canada, leading exports markets for U. S. automobiles to provide additional business to take up the slack in exports to Europe. Machine tool builders look for increased business from South America and Japan.

What Happened in 1914 and 1918

Many industries are studying conditions prior to 1914, when the first World war began, and in 1917, when this country entered on the side of the Allies, in order to map a course through the difficulties just ahead. Here is what happened in the steel market from 1914 through 1918.

Finished materials in 1914 gradually dropped as consumption fell off. There was an effort to advance prices in August, under the belief that the war would cause an increased call for American steel, but business continued to fall off, the low prices of the year being reached in December, when many plants operated only about one-third of capacity.

January, 1915, brought some activity to make up for the depression just preceding. As spring came on, war demand for steel increased, and export prices advanced. An unparalleled scarcity of steel developed in the late summer and billets advanced rapidly. Plates soared late in the year, and wire products reached the highest point for 15 years in December. Pig iron lagged until August, and then rose, the advance by the end of the year being $5 or $6 a ton.

In 1916 advances in all forms of finished material, due to the enormous demand for shell steel from the Allies and to export demand from all countries, made what were considered high prices in 1915 look cheap. Mills were utterly unable to cope with the business offered, both export and dimestic. Pig iron, which for months lagged far behind steel, began advancing in September after heavy sales to Europe, and in November the excited scramble for iron for delivery in 1917 sent prices up by leaps and bounds. The upward movement continued uninterrupted in 1917 and demand in some products was only intensified by the entrance of the United States into the war.

The climax was reached in July, and the turn came after President Wilson's appeal to producers in all lines to make one price to the Government, its Allies and the public. Government prices, which generally were from 30 to 50 per cent below the high level prices, prevailed in the last three months of the year. In 1918 Government control continued, with no change in prices of finished material and only a slight reduction in pig iron. In the middle of December, five weeks after the armistice, rolled products were reduced $4 to $6 a ton, on the ending of Government control, and an open market came again.

Late 1939 finds the United States industry generally in all ways prepared to ship a vast quantity of war materials to Europe and to provide the means of waging war if war should involve this country. Ability of the railroads to handle a possibly large volume of war-developed traffic is a question mark.

The steel industry today finds itself in the most efficient and streamlined condition of its history, fully capable of adequately taking care of national preparedness programs, national war measures, as well as being able to take care of a large export demand.

Plants Modernized to Meet Great Demand

The industry's present satisfactory conditions extends from the blast furnace to the open-hearth, to the up-to-date finishing mills, and to distribution, the latter being adequately supplemented by newly developed and far reaching market research bureaus within the industry.

From a standpoint of production, steel mills could step up steel ingot output much quicker than was the case in 1914 or 1918 and still produce the same quality of steel now being made. Open-hearths and soaking pits have been overhauled in the past few years with bottlenecks eliminated as far as practicable. In case of scrap shortage, some major steel companies other than those whose normal practice it is, can immediately begin the making of steel by the duplex method which utilizes metal blown in the bessemer converter and taken to the open-hearth for refinement. Recent researches in bessemer steel practice have also greatly improved this type of steel

INGOT CAPACITY OF U. S. IN WAR YEARS

(Steel ingots and castings in gross tons)

1914	World war begins	39,689,265
1917	U. S. declares war	52,541,445
1939	2nd European war	73,061,569

STEEL EXPORTS FROM U. S. IN FIRST WORLD WAR

	Semi-finished	Pig Iron	All Products*
1913	91,847	277,648	2,745,635
1914	50,496	114,423	1,949,554
1915	560,704	224,509	3,532,608
1916	1,504,502	607,236	6,101,134
1917	2,017,113	656,220	6,439,067
1918	1,786,289	269,575	5,375,281

* Includes tonnage of pig iron, semi-finished and finished steel and scrap.

Tool Industries Ready

By JAMES A. ROWAN
News Editor of The Iron Age

with the result that in an emergency much larger quantities than are now produced could be made.

Soaking pits, which in 1936 threatened to be a serious bottle-neck during that period of increased steel production, have been either renovated or replaced by larger capacity at many plants since that time. Not only has capacity been increased, but precise control of steel quality is possible under any circumstances, regardless of the heavy demand.

Blooming mills throughout the industry have been modernized in many cases, while a considerable number of new roughing mills have been installed within the past several years, thus holding to a minimum the chance of bottlenecks between steel making and steel finishing.

The industry's mammoth continuous mills which now have an annual capacity of over 16,000,000 tons of flat rolled products, present a means of quick manufacture undreamed of in 1914. Many of these continuous mills have been and are now in a position to roll out light gage plates which can be used in war preparation. There are sufficient wide plate mills, not of the continuous type, which can take care of thicker gage plates. Put to an emergency test, it is more than likely that steel producers quickly could find new uses for their wide continuous mills.

There are indications that the nation's steel industry could fully mobilize its resources on a war scale within six months without in any way affecting general domestic demand, while if the latter were sacrificed to some extent, the mobilization could take effect in a much shorter period.

The steel industry today is much closer to and knows far more about its consumers and their requirements than was the case in 1914 and 1918. What is now considered as routine scheduling of finishing mills for certain sizes and prompt delivery on difficult sections or products, would have been impossible 15 or 20 years ago. This rigid control over maintenance and operation has enabled the American steel industry to serve its consumers in a manner unparalleled in the world. This same ability would supplement and cut to a minimum domestic consumer disturbances which might otherwise result in case of preparedness or war time production.

From the steel consumers' standpoint, the present situation is one well worth studying. Steel prices today, both actual and published, are at a point where most steel makers have made little or no profit. Prices on leading products are less than they were in 1918 and in 1937. With an exceptionally good possibility that foreign nations engaged in war will seek supplies in this country soon, and with the established fact that countries such as South American interests may look to the United States for supplies heretofore purchased abroad, there is a likelihood of not only higher prices in the future should European hostilities continue, but there would also arise serious delivery problems if domestic consumers attempted to maintain present hand-to-mouth buying policies.

Already, because of the sustained domestic miscellaneous demand and the growing automotive requirements, minor delivery problems have developed. While there is no disposition on the part of any steel producer to countenance speculative steel buying or to create conditions which might lead to such purchasing, steel prices would have a long way to go before they could be termed as exhorbitant.

Steel price and production controls can, in the present disturbed situation, be set up at short notice by the newly-created War Industries Board, headed by Edward L. Stettinius, Jr., chairman of U. S. Steel Corp.

Machine Tool Industry Would Be Under Strain

Capacity of machine tool producers would be severely taxed in the event the United States should be drawn into a war. This is apparent because recent production, consisting of foreign business to a large extent due to comparatively light domestic demand, has forced some plants to operate extra shifts. The combination of foreign and domestic wartime demands would definitely create a strain, and capital goods producers would be in the market heavily.

Present day machine tools are far more productive and efficient than those in 1914, however. During the World war, the machine tool industry's peak of shipments was attained in 1917, and never since equaled. By 1919 the industry was employing around 53,000 persons, a record figure. Strong inquiry has developed in the middle west for used machine tools recently. Representatives of eastern dealers have been increasingly active, either on behalf of foreign nations or in anticipation of virile demand soon.

Recent foreign machine tool business has been principally with England, France and Japan. The English have purposely bought American machine tools for their munitions and airplane plants so that they could be free to quote quick deliveries in their regular world markets.

* * *

Editor's Note—A fully-detailed description of the activities of the War Industries Board, the World war organization whose experience in regulating industry will be used in functioning of the 1939 board, is given in this issue by L. W. Moffett, Washington correspondent of THE IRON AGE. *Turn to page 60.*

HOW STEEL PRICES VARIED IN WAR YEARS

	Tin Plate (per box)	Sheets (per lb.)	Billets (per ton)
1914	$3.35	1.95c.	$21.00
1917	12.00	8.50c.	100.00
1939	5.00	*3.10c.	34.00

(All maximum prices, Pittsburgh)

*24 to 32 in.

SCRAP EXPORTS, IMPORTS, PRICE IN WAR PERIOD

	Exports	Imports	Consumed In U. S.	Peak Price In U. S.
1913	94,429	44,154	15,300,000	$13.55
1914	33,134	34,839	12,200,000	12.00
1915	79,361	79,982	18,600,000	11.75
1916	212,765	116,039	23,400,000	15.88
1917	145,574	180,034	26,800,000	41.00
1918	2,160	63,730	25,400,000	28.62

*No. 1 heavy melting, Pittsburgh.

Iron and Steel Imports (In Gross Tons)	July		Seven Months Ended July	
	1939	1938	1939	1938
Pig iron	6,189	936	22,043	21,301
Sponge iron	107	5	978	323
Ferromanganese[1]	1,985	1,309	20,493	6,378
Spiegeleisen	3,873	203	17,842	5,027
Ferrochrome[2]	18	28	111	99
Ferrosilicon[3]	78	37	874	315
Other ferro-alloys[4]	30	.....	162	1
Scrap	3,335	634	18,138	1,804
Pig iron, ferroalloys and scrap	*15,615*	*3,152*	*80,641*	*35,248*
Steel ingots, blooms, etc.	.....	3	4	7
Billets, whether solid or hollow	20	1	225	378
Wire rods	727	278	5,738	2,798
Semi-finished steel	*747*	*282*	*5,967*	*3,183*
Concrete reinforcement bars	20	89	2,000	662
Hollow steel bars	206	47	842	476
Merchant steel bars	1,406	884	11,860	11,382
Iron slabs	.....	.....	.....	.....
Iron bars	88	24	401	335
Boiler and other plate (including skelp)	1	10	20	120
Sheets, skelp, and saw plate	243	110	1,276	5,285
Die blocks or blanks, etc.	.....	2	80	66
Tin plate, taggers' tin and terne plate	1	25	37	55
Structural shapes	4,867	2,507	30,742	24,454
Sashes and frames	.....	.....	5	.....
Sheet piling	.....	.....	462	.....
Rails and track material	271	231	4,498	1,983
Welded pipe	278	355	3,900	2,788
Other pipe	131	887	24,377	13,651
Cotton ties	2,318	3,085	3,383	3,331
Other hoops and bands	1,556	1,040	12,446	10,729
Barbed wire	1,612	692	11,870	8,518
Round iron and steel wire	97	107	1,395	684
Telegraph and telephone wire	.....	.....	2	5
Flat wire and steel strips	238	168	1,808	1,521
Wire rope and strand	141	99	1,196	1,218
Other wire	82	97	1,198	919
Nails, tacks, and staples	838	626	5,741	4,097
Bolts, nuts, and rivets	3	12	66	93
Horse and mule shoes	42	33	245	248
Rolled and finished steel	*14,439*	*11,130*	*119,850*	*92,620*
Malleable iron pipe fittings	6	5	108	42
Cast iron pipe and fittings	14	22	401	898
Castings and forgings	30	137	878	1,722
Total	30,851	14,728	207,845	133,713

[1] Manganese content; [2] chrome content; [3] silicon content; [4] alloy content.

Iron and Steel Exports (In Gross Tons)	July		Seven Months Ended July	
	1939	1938	1939	1938
Pig iron	6,021	10,371	33,954	226,151
Ferromanganese and spiegeleisen	147	4	185	227
Other ferroalloys	135	51	812	703
Scrap, iron and steel	347,249	125,399	2,123,264	1,910,771
Scrap, tin plate	2,230	688	10,087	9,519
Waste-waste tin plate	587	336	5,717	4,446
Pig iron, ferroalloys and scrap	*356,369*	*136,849*	*2,173,969*	*2,151,817*
Ingots, blooms, billets, sheet bars	9,672	17,779	58,836	136,197
Ingots, etc., alloy steel, including stainless	8	83	6,616	4,982
Skelp	3,584	1,023	8,221	7,641
Wire rods	3,706	1,312	14,309	18,279
Semi-finished steel	*16,970*	*20,197*	*87,982*	*167,099*
Bars, plain and reinforcing	14,792	8,792	86,706	87,525
Bars, alloy steel	432	361	7,826	2,588
Bars, stainless steel	19	14	212	224
Iron bars	62	37	373	851
Plates, plain and fabricated	14,721	17,306	147,077	135,397
Plates, alloy steel	312	82	999	2,032
Plates, stainless	11	2	51	136
Sheets, galvanized steel	9,201	7,821	52,723	41,364
Sheets, galvanized iron	748	272	3,411	2,272
Sheets, black, plain steel	19,519	13,934	151,944	113,328
Sheets, alloy steel	398	8	1,943	2,297
Sheets, stainless	119	110	552	909
Sheets, black iron	546	678	3,883	4,100
Hoops, bands, strips, plain steel	4,661	2,602	38,319	32,711
Hoops, bands, strip steel alloy	27	30	228	188
Hoops, bands, strip steel, stainless	187	80	629	362
Tin plate and taggers' tin	22,264	12,802	121,219	102,030
Terne plate (incl. long ternes)	348	360	2,277	2,917
Structural shapes, plain material	10,078	6,402	51,747	55,838
Structural material, fabricated	2,039	2,153	18,593	22,272
Sheet piling	439	83	3,374	1,952
Tanks, steel	2,445	2,466	16,006	19,868
Steel rails	5,557	1,960	38,665	40,727
Rail fastenings, switches, spikes, etc.	1,044	1,042	9,429	6,669
Boiler tubes	555	598	4,294	5,429
Casing and oil line pipe	4,686	3,995	40,363	50,872
Pipe, black and galv., welded steel	2,812	2,052	21,661	13,038
Pipe, black and galv., welded iron	779	291	3,758	2,762
Plain and galvanized wire	4,044	5,667	29,572	26,804
Barbed wire and woven wire products	4,916	4,147	27,179	17,063
Wire rope and other products	980	812	7,185	6,191
Nails and tacks	2,415	2,866	14,178	13,366
Bolts, nuts, rivets and washers except track	630	643	4,625	4,779
Other finished steel	889	203	4,307	2,241
Rolled and finished steel	*132,675*	*100,671*	*915,368*	*821,102*
Cast iron pipe and fittings	1,813	2,806	19,120	14,526
Malleable iron screwed fittings	346	254	2,147	1,790
Carwheels and axles	3,465	1,889	15,498	14,127
Castings, iron and steel	419	485	3,265	3,723
Castings, alloy steel, incl. stainless	219	78	956	517
Forgings, plain	1,324	461	6,296	4,499
Forgings, alloy steel, incl. stainless	64	9	1,290	246
Castings and forgings	*7,650*	*5,982*	*58,572*	*39,428*
Total	513,664	263,699	3,225,891	3,179,446

Steel Imports Drop In July; Pig Iron Up

WASHINGTON — Imports of iron and steel products in july dropped to 27,516 gross tons from 30,050 tons in June but for the first seven months of the current year they rose to 189,707 tons from 131,909 tons in the corresponding period of last year. Declines in July were general, with several exceptions, including pig iron and cotton ties which showed increases.

United States Imports of Pig Iron by Countries of Origin

(In Gross Tons)

	July		Seven Months Ended July	
	1939	1938	1939	1938
United Kingdom	....	...	....	42
British India	3,816	...	13,322	10,658
Germany	....	499	....	....
Netherlands	1,636	...	6,473	5,712
Canada	737	250	2,048	1,351
France	....	187	....	....
Belgium	....	...	....	....
Norway	....	...	....	3,538
Sweden	....	...	100	....
Russia	....	...	....	....
Other countries	....	...	100	....
Total	6,189	936	22,043	21,301

July Imports of Iron and Manganese Ores

(In Gross Tons)

	Iron Ore		Manganese Concentrates, 35 Per Cent or Over	
	1939	1938	1939	1938
Canada	188	120	....	....
Cuba	32,122	....	5,835	2,890
Chile	155,825	144,050	....	....
Spain	....	....	....	....
Norway	30,893	....	....	....
Sweden	2,884	53,677	....	....
French Africa	....	....	....	....
Russia	....	....	202	7,720
India	....	....	483	2,145
Brazil	....	2,800	....	3,545
Gold Coast	....	....	17,601	5,048
Other countries	110	5,023	29	1
Total	222,022	205,760	24,150	21,349

Exports 35% of Total Stran-Steel Business

DETROIT—Though Stran-Steel, a light gage steel framing for houses, has been sold in foreign markets slightly more than two years, the foreign sales this last year have amounted to approximately 35 per cent of the business, according to Karl A. Dietrich, general manager of the Stran-Steel Division of the Great Lakes Steel Corp. The foreign sales have been made primarily in South America and the islands off South America, in addition to sales in the Far East. Largest volumes of sales have been made in Venezuela, while Colombia, Curacao, Trinidad and Jamaica have taken considerable volume. Framing for 50 homes has been shipped to Persia in the Far East.

AFL Loses Another Decision to CIO In Koppers Ruling

WASHINGTON—The AFL lost another tussle with the CIO last week when the National Labor Relations Board held that AFL's International Union of Operating Engineers, Local 36, was not the appropriate unit for certification as the sole bargaining agent of the engineers and firemen in the boilerhouse and by-products department of the Koppers Co., St. Paul. In consequence CIO's Gas and By-Products Coke Workers, Local 12016, District 50 United Mine Workers, remains as the exclusive bargaining representative of all the hourly-paid workers in the company's employ.

The Board, in dismissing the AFL petition, held that to grant it was to break off "a fragment of the traditional craft group." It reached this conclusion because of the alternating character of the work done by the engineers and firemen. The company employs some 51 in this classification, of which the Operating Engineers requested a unit comprising only 17. The board found that those included in the proposed unit at times do the work of other men. Also, the board said, there occur frequent transfers of employees among the several departments in furtherance of the company's established inter-department seniority rules, and policy of promotion from the ranks.

Sloss-Sheffield Election

The board last Wednesday ordered a secret ballot election within 15 days among the production and maintenance employees of Sloss-Sheffield Steel & Iron Co., at its Red Ore Mine, Sloss, Ala., to determine whether or not they desire to be represented by Sloss Red Ore Local 109, International Union of Mine, Mill and Smelter Workers, affiliated with the Congress of Industrial Organizations.

In June 1939, Local 109 asked that it be recognized as the sole bargaining representative of the company's employees. This, the board said, the company refused to do on the ground that it was bound by a contract with representatives of its employees which does not expire until Sept. 13, 1939. Since the contract by its terms will expire on that date, the board held that it does not bar the certification of representatives for the purpose of negotiating new agreements.

The company, according to the board, further contended that it recognized the union by entering into contracts with employee representatives who are members of the union. To this, the board replied that such a contract does not mean recognition of the union inasmuch as it provides that the company is dealing with a committee for such red ore miners "as they shall represent." Such recognition, the Board declared, does not constitute the exclusive recognition which the union here is seeking to obtain by certification.

Carnegie-Illinois Gets "Corronizing" License

PITTSBURGH—Standard Steel Spring Co., Coraopolis, Pa., has issued a license to the Carnegie-Illinois Steel Corp., for the use of Standard's "Corronizing" process used in applying a non porous coating of nickel to steel surfaces. This is the third company to be licensed, the other two being Youngstown Sheet & Tube Co. and Republic Steel Corp.

Meaning of NLRB's Term, "Disestablish," Is Defined

WASHINGTON—When the National Labor Relations Board tells an employer to "completely disestablish" the union which the board has found to be employer-dominated, the order does not mean that the employer must dissolve the employer-dominated union, says The United States Law Week.

"The Tenth Circuit Court of Appeals so rules," the publication points out. "The Labor Board's order is construed to mean merely that the employer must cease recognizing the union as representative of its employees. Thereafter, according to the court, if such union is 'freely' chosen as representative after the board's order has effected its purpose, then the employer is not precluded from recognizing the union."

The case cited was that of Swift & Co. against the board. It was decided Aug. 4.

Gar Wood Division Sold

CHICAGO—The motor coach division of Gar Wood Industries, Detroit, has been acquired by General American Transportation Co., Chicago. The entire manufacturing assets of the former organization are being moved to a new plant in Hegewisch, Ill., in the Chicago district, adjoining the present factory of the Pressed Steel Car Co. and leased from that company. It is believed the plant will be in readiness for production within 30 to 60 days.

Hopkins' Move To Alter Wagner Act Reported

WASHINGTON—Business representatives who have been conferring with Commerce Department officials of late expect that, by the time the five-man House committee named to investigate the National Labor Relations Board meets on Sept. 7, Harry L. Hopkins will have recommended to the Senate Education and Labor Committee that the Wagner Act be revised to make it less objectionable to industry.

Also, there were indications that Secretary of Labor Perkins would speak highly of her department to the Senate committee and recommend that the NLRB, now an independent agency, be brought under her jurisdiction so that there could be greater coordination and less lost motion with her Labor Conciliation Service and the labor board. Madam Perkins has made such a recommendation many times before but each time has received only a sharp rebuff.

Meanwhile, chances for revision of the Wagner Act at the next session of Congress appeared remote. While the House investigation of the NLRB will serve to keep interest in Wagner Act revision active during the recess, the probe, even though there is no likelihood of the board being whitewashed, may serve to delay action on revision rather than to hasten it.

25 Toledo Industries Can Produce War Supplies

TOLEDO—More than 25 large industries in Toledo would probably be called on to manufacture some supplies for the army and navy in event of a national emergency.

Accurate surveys of the plants have been made by the army ordnance department in recent years and in some cases full plans for tooling, rearrangement of machinery and educational orders have been provided.

Machine tools, gun carriages, fuses, sights, recoil mechanism for guns, and many truck and airplane parts are included in Toledo's potential wartime output.

Fansteel Redeems Bonds

ALL outstanding first mortgage and collateral 6 per cent sinking fund gold bonds, due Feb. 1, 1943, and constituting the total bonded indebtedness of the Fansteel Metallurgical Corp., North Chicago, Ill., will be redeemed at 110 on Oct. 2, 1939, according to a formal notice to bondholders by Robert J. Aitchison, president.

Canadian Plants Pushing Ahead On War Equipment Manufacture

TORONTO, Sept. 5—With the outbreak of hostilities in Europe, plans are being pushed ahead rapidly toward getting plants in shape for production of armaments and munitions in this country. Demand for tools and special equipment has increased considerably in recent weeks, and it is reported in some quarters that manufacturers of equipment are well behind on deliveries. Rebuilt tools are said to be at a premium. According to announcements over the week end, a number of Canadian industrial concerns have been warned their plants will be taken over by the Government. Intimation also is given that a number of large contracts soon are to be placed with Canadian firms for war supplies. Airplane plants are running at full time on previous orders. New airplane plants and additions to existing works are being rushed to completion, and announcement has been made that the Department of Defense, Ottawa, will rush construction of air force barracks at Camp Borden, Ont., to cost $400,000.

Domestic demand for iron and steel materials also is showing improvement. The automotive industry is starting work on 1940 models and substantial orders for steel and other materials is reported from this quarter. Building trades also are showing continued activities with betterment in some quarters, resulting in better demand for structural and reinforcing steel as well as builders' hardware. It is understood that radiator firms are getting ready for an active season and demand for raw materials from these consumers has gained during the past week or 10 days. Iron and steel prices are unchanged and local steel interests state there is no immediate indication of revision.

Dominion Foundries & Steel, Ltd., Hamilton, Ont., announces that contracts have been let for main equipment units for a new temper mill to cost $500,000, of which $400,000 will be spent for equipment. Construction work will be started within a month or six weeks. Installation of this new equipment will permit production of a greater range of products. In addition tempering and other operations now done by hand will be done by machinery which will be capable of handling lengths of strip at the rate of 1500 to 1800 ft. per min.

Merchant pig iron sales continue to show improvement and, while sales for the week were all for spot delivery, it is stated that some melters are beginning to issue inquiries regarding supplies for last quarter. The melt has been stepped up to above the 60 per cent mark with indications of still higher schedules. Producers are supplying merchant iron from stock piles but it is stated that with the increased demand now developing production of foundry and malleable iron will be increased in the immediate future. Five furnaces are blowing.

Bethlehem Workers Attack Labor Board

WASHINGTON — Severe criticism of the National Labor Relations Board was voiced to the Senate Committee on Education and Labor last week by employees of the Bethlehem Steel Co.'s shipbuilding division and of the Weirton Steel Co.

"Our men," wrote Harold F. Murray of Quincy, Mass., secretary of the employees' representative body of Bethlehem's shipbuilding division, "believe they are now faced with a deliberate attempt by the labor board to deprive them of the right to be represented for purposes of collective bargaining by representatives of their own choosing."

The general advisory committee of the Weirton Steel Employees Security League and the general advisory committee of the Weirton Steel Employee Representatives told the committee they were under the impression that "the United States Government, as represented by the NLRB, is not interested in the welfare of the workingman, but only in promoting and maintaining the interests of the communistically saturated CIO."

Senator Thomas, Democrat of Utah, and committee chairman, has received scores of communications critical of the NLRB since public hearings were recessed when the Congressional session ended last month. The Senate committee, he said, probably will not consider amendments to the Wagner Act until a House committee headed by Representative Smith, Democrat of Virginia, reports on the forthcoming investigation of the labor board.

The labor board has recognized the AFL's International Association of Machinists as the collective bargaining representative for a majority of the machinists, tool and die-makers, maintenance mechanics, apprentices and helpers at the National Can Corp., Maspeth, N. Y. The CIO's Steel Workers Organizing Committee was recognized as the representative for all other employees.

. . . PERSONALS . . .

M. L. JACOBS, formerly general manager of limestone properties of Bethlehem Steel Co., has been appointed assistant to C. A. BUCK, vice-president. J. P. PEACOCK has been advanced from superintendent of the Bridgeport quarry to general manager of limestone properties, succeeding Mr. Jacobs. HUBERT MERRYWEATHER has been appointed general manager of ore properties. Mr. Jacobs was graduated from Lehigh University in 1910, and entered the employ of Bethlehem Steel Co. in 1916, as superintendent of quarries. He became manager of quarries, Bethlehem Mines Corp., in 1920, and general manager of quarries, Bethlehem Steel Co., in 1934.

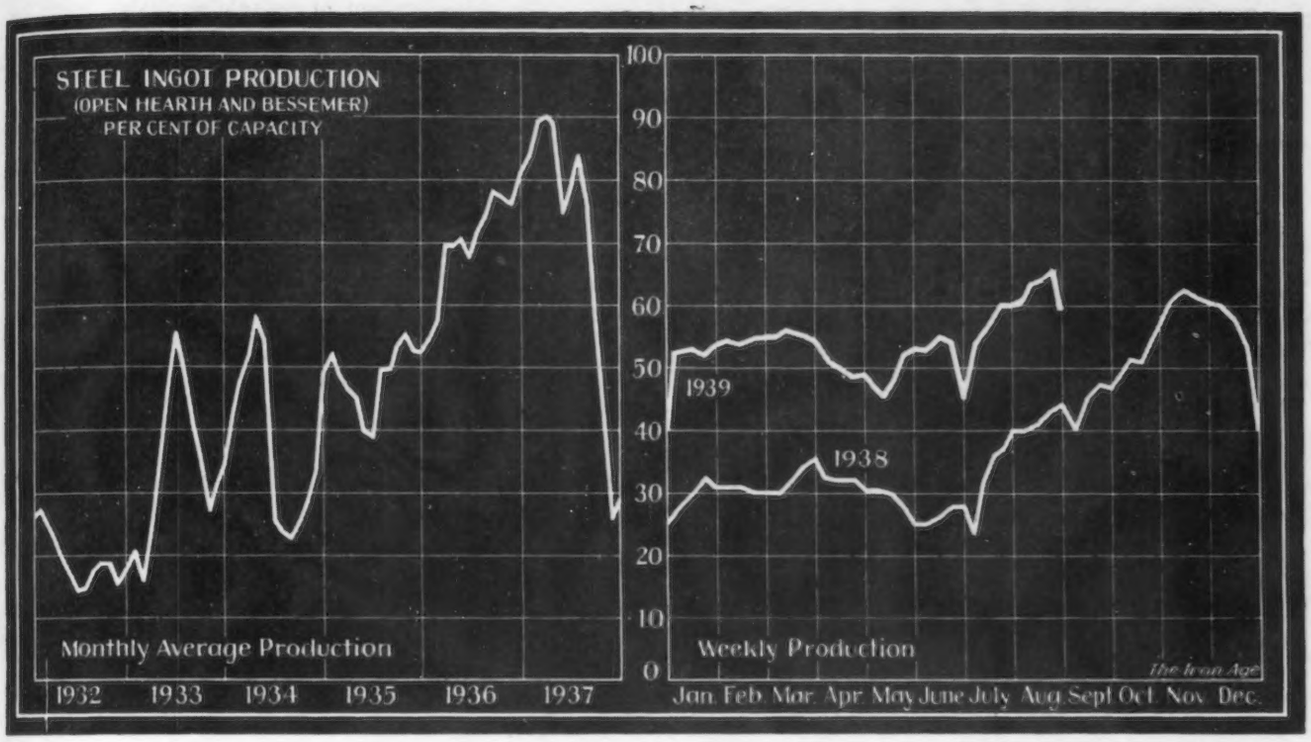
Mr. Peacock started with Bethlehem in 1917, as superintendent of the Steelton quarry, and in 1924 became superintendent of the Bethlehem quarry, continuing in that position until 1938, when he was appointed superintendent of the Bridgeport quarry. He is a graduate of Princeton University, class of 1910.

Mr. Merryweather was graduated from Massachusetts Institute of Technology in 1904. Following several years as mine superintendent at various properties in Michigan and Mexico, he went with Bethlehem in 1910, serving as mine superintendent and subsequently vice-president and general manager of the Juragua Iron Co., and vice-president and general superintendent of the Bethlehem-Chile Iron Mines Co. He later conducted extensive mining studies in Spain, Morocco, Venezuela and other countries.

❖ ❖ ❖

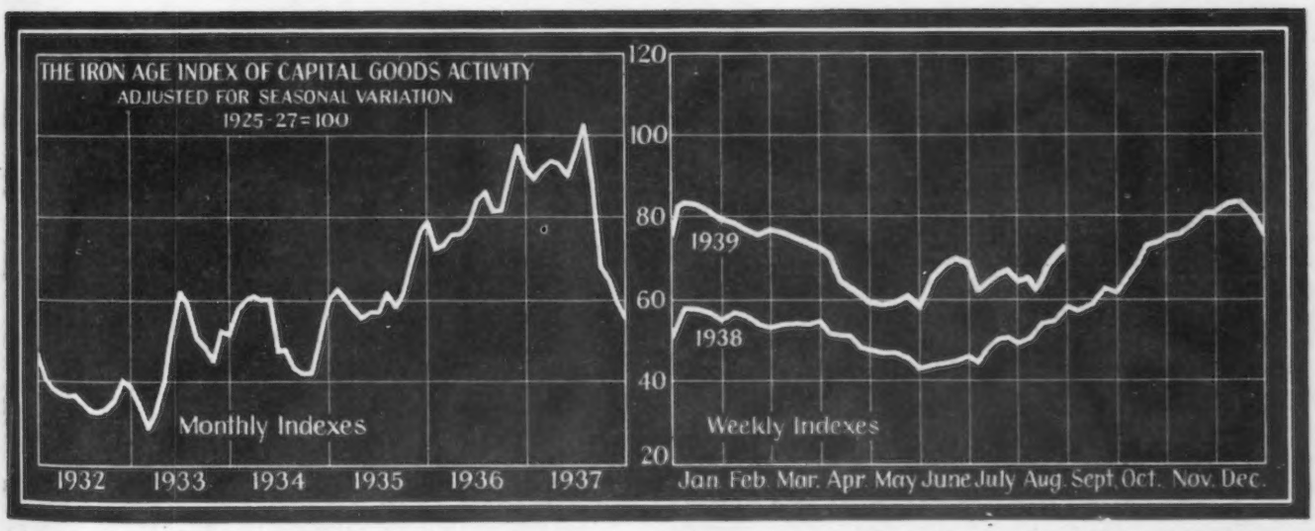
R. B. NICHOLS, who has been associated with the bearing business for the past 15 years, most of this time with the Bantam Bearings Corp., South Bend, Ind., has been elected secretary of the company. In addition to his new duties, Mr. Nichols will continue as sales manager of the Bantam company.

Holiday Cuts Ingot Output to 59% of Capacity



District Ingot Production, Per Cent of Capacity	Pitts-burgh	Chicago	Valleys	Phila-delphia	Cleve-land	Buffalo	Wheel-ing	Detroit	Southern	S. Ohio River	Western	St. Louis	East-ern	Aggre-gate
CURRENT WEEK..	53.0	51.0	53.0	43.0	70.0	61.0	78.0	97.0	78.0	59.0	50.0	52.0	70.0	**59.0**
PREVIOUS WEEK..	58.0	54.5	56.0	48.0	81.0	64.0	83.0	94.0	75.0	62.5	54.0	66.0	75.0	**63.5**

Gains in All Factors Push Index to Summer High Point



WITH automobile assemblies sharply up, steel ingot production pushing into higher ground against the seasonal trend, heavy engineering construction up 9 per cent over a figure revised drastically upward the week before and smaller gains in lumber carloadings and in the Pittsburgh indices, THE IRON AGE index of capital goods activity has made the sharpest gain in several months, bringing the figure to new, high ground for the summer period at 70.6, representing a gain of almost five points over the previous week. This move brings the index past the hump of 69.9 recorded for the week ended June 24, just before the holiday dip to 61.9, and establishes the index at figures prevailing in mid-April. The index started the year at 82.2 and declined steadily to the week ended May 13, at 59.1, from which point the curve has experienced a series of ups and downs. Further gains in automotive production should continue the upward trend next week.

	Week Ended Sept. 2	Week Ended Aug. 26	Comparable Week 1938	Comparable Week 1929
Steel ingot production[1]	96.8	94.9	66.5	124.0
Automobile production[2]	48.0	29.1	48.4	120.0
Construction contracts[3]	70.6	68.7*	68.0	109.8
Forest products carloadings[4]	57.0	55.9	55.1	120.8
Production and shipments, Pittsburgh District[5]	80.5	79.9	53.9	125.8
Combined index	**70.6**	**65.7***	**58.4**	**120.1**

*Revised.

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. *Engineering News-Record*; 4. Association of American Railroads; 5. University of Pittsburgh.

. . . SUMMARY OF THE WEEK . . .

THE outbreak of war in Europe has had a marked effect on iron and steel markets here even in the few days that have elapsed. Export and import markets have naturally received the greatest stimulus, though domestic consumers, sensing the possibility of slower deliveries and higher prices, have been quick to protect themselves by ordering more freely.

Steel export departments have been flooded with cables from all parts of the world seeking supplies here or urging a hastening of shipments of steel previously ordered. Steel export prices have been advanced several dollars a ton, in most instances to parity with domestic prices. Tin plate, for which there has been a sharp demand, has been sold at $6 a ton over recently quoted prices.

The export quota system and world export prices set up by the International Steel Cartel in cooperation with the Steel Export Association of America have gone by the board. A worldwide market is open to American producers without restriction, though shipments abroad may be hampered by the lack of sufficient ocean bottoms. The Neutrality Act does not prohibit the sale of raw materials, including steel, pig iron and scrap, to warring nations, but exporters are in most instances not quoting to belligerents until there is definite assurance that ships of foreign registry will be provided. All quotations are being made in terms of American currency.

Possibly a half-million tons of scrap which Great Britain has bought in the United States remains to be shipped, but as it takes more boats to ship scrap than steel it seems likely that some scrap shipments may be deferred in favor of semi-finished steel, of which the British are in Great need, because supplies from the continent of Europe, which have amounted to about 500,000 tons a year, will be partly or wholly shut off.

THE British minister of supply has established control over the iron and steel industry. Prices have been fixed until Oct. 31 at recent levels. Government priorities and licenses to buy for commercial purposes have been put into effect. Canada probably will also take control of its industrial plants, some of which, now devoted to automobiles or other commercial manufacture, may be converted to airplane and munition production.

The possibility of some form of government control over prices of iron, steel and other products is being explored by the Department of Justice on orders from President Roosevelt. The Administration apparently believes that export orders will send steel prices much higher. Washington advices indicate that new legislation will be requested at the special session of Congress soon to be called.

Meanwhile, the steel industry is contemplating no general price advances for fourth quarter, although a $2 a ton rise on hot rolled sheets may be put into effect to restore in part the losses caused by last May's sharp price break. There is talk of an advance of $1 a ton on pig iron, but it is purely tentative. However, export prices of pig iron have already advanced. Initial orders from Europe probably will be for pig iron and semi-finished steel. As ships are not at present available, consummation of such business may not develop immediately.

Raw materials essential to steel manufacture, particularly manganese ore, chrome ore and tin, constitute one of the problems of the steel industry which make the future course of steel prices unpredictable. Tin has advanced more than 10c. to 59c. a lb., within a few days and may go higher, as there are no supplies available even at the advanced price. The tin situation probably precludes the possibility of a reduction in the domestic price of tin plate, which some buyers had expected. Ferromanganese producers are withholding announcement of fourth-quarter prices until they have a clearer view of the manganese ore import situation.

THE export and import situation, coupled with an increasing demand for steel from the automobile industry and from miscellaneous consumers who appear to be anxious to protect themselves against shortages, is expected to create a tense steel situation within a short time. With the exception of structural steel and tin plate, orders have been sharply increasing. Any slowing up in the domestic demand for tin plate, due to seasonal factors, probably will be more than made up by exports within the near future. Sales of some products in August were 25 to 30 per cent in excess of those booked in July. Increases were sharpest in sheets and bars, but pipe sales were the best since the Fall of 1937. Structural steel projects are light, but specifications received by the mills against previously awarded jobs are in good volume.

Railroad buying looms as an added factor. The Chesapeake & Ohio has placed orders for 2500 cars, the Delaware & Hudson is inquiring for 1000, and the Chicago Rapid Transit Co. is in the market for the same number of subway-elevated cars. Railroad repair shops are being reopened as traffic requirements increase.

STEEL production this week was only slightly affected by Labor Day shutdowns, the average for the week being estimated at 59 per cent against 63½ per cent last week. Recovery of operations on Tuesday was swift, indicating that next week's operations will be fully 65 per cent.

Pig-iron output in August gained 12.9 per cent over July, based on a daily average of 85,800 gross tons against 76,009 tons in the previous month. Total output was 2,659,813 tons in August compared with 2,356,270 tons in July. There were 138 furnaces in blast on September 1, a gain of eight over the revised figure of 130 in blast on August 1. U. S. Steel made a gain of five, independents a net gain of two, and one merchant stack came in.

Scrap markets are for the most part awaiting further developments in the foreign and domestic situation. There have been advances of 75c. a ton at Cleveland and 50c. at Youngstown on No. 1 heavy melting steel, but prices are unchanged at Pittsburgh, Chicago and Philadelphia. THE IRON AGE scrap composite price, therefore, remains at $15.62.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Sept. 5, 1939	Aug. 29, 1939	Aug. 8, 1939	Sept. 7, *1938
Rails, heavy, at mill	$40.00	$40.00	$40.00	$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	40.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	34.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	34.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	34.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	40.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	43.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	1.90

Finished Steel

Cents Per Lb.:	Sept. 5, 1939	Aug. 29, 1939	Aug. 8, 1939	Sept. 7, *1938
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.15	2.15	2.15	2.25
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont	2.10	2.10	2.10	2.10
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.10
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.65	2.65	2.65	2.70
Alloy bars: Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Cleveland	2.70	2.70	2.70	2.80
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.00	2.00	2.00	2.15
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.80	2.80	2.80	2.95
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.50	3.50	3.50	3.50
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.00	2.00	2.00	2.15
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.05	3.05	3.05	3.20
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham	2.40	2.40	2.40	2.45
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham	2.60	2.60	2.60	2.60
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham	†3.25	3.25	3.25	3.20
Tin plate, 100 lb. base box: Pittsburgh and Gary	$5.00	$5.00	$5.00	‡$5.35

*Pittsburgh prices only.
†Applies to 80-rod spools only.
‡Subject to post-season adjustment.

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	Sept. 5, 1939	Aug. 29, 1939	Aug. 8, 1939	Sept. 7, *1938
No. 2 fdy., Philadelphia	$22.84	$22.84	$22.84	$21.84
No. 2, Valley furnace	21.00	21.00	21.00	20.00
No. 2, Southern Cin'ti	21.06	21.06	21.06	20.06
No. 2, Birmingham	17.38	17.38	17.38	16.38
No. 2, foundry, Chicago†	21.00	21.00	21.00	20.00
Basic, del'd eastern Pa.	22.34	22.34	22.34	21.34
Basic, Valley furnace	20.50	20.50	20.50	19.50
Malleable, Chicago†	21.00	21.00	21.00	20.00
Malleable, Valley	21.00	21.00	21.00	20.00
L. S. charcoal, Chicago	28.34	28.34	28.34	28.34
Ferromanganese, seab'd carlots	80.00	80.00	80.00	92.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:	Sept. 5, 1939	Aug. 29, 1939	Aug. 8, 1939	Sept. 7, *1938
Heavy melting steel, P'gh	$16.25	$16.25	$15.125	$15.25
Heavy melting steel, Phila.	16.75	16.75	16.25	14.25
Heavy melting steel, Ch'go	13.875	13.875	13.875	13.75
Carwheels, Chicago	12.75	12.75	12.75	14.25
Carwheels, Philadelphia	16.25	16.25	16.25	17.25
No. 1 cast, Pittsburgh	16.00	16.00	15.25	15.25
No. 1 cast, Philadelphia	16.75	16.75	16.75	16.25
No. 1 cast, Ch'go (net ton)	12.75	12.75	12.75	13.25

Coke, Connellsville

Per Net Ton at Oven:	Sept. 5, 1939	Aug. 29, 1939	Aug. 8, 1939	Sept. 7, *1938
Furnace coke, prompt	$3.75	$3.75	$3.75	$3.75
Foundry coke, prompt	4.75	4.75	4.75	4.75

Non-Ferrous Metals

Cents per Lb. to Large Buyers:	Sept. 5, 1939	Aug. 29, 1939	Aug. 8, 1939	Sept. 7, *1938
Copper, Electrolytic, Conn.	**12.50**	10.50	10.50	10.125
Copper, Lake, New York	**12.50**	10.50	10.50	10.25
Tin (Straits), New York	**59.00**	49.125	48.80	42.75
Zinc, East St. Louis	**5.75**	4.75	4.75	4.75
Zinc, New York	**6.14**	5.14	5.14	5.14
Lead, St. Louis	**5.10**	4.90	4.90	4.75
Lead, New York	**5.25**	5.05	5.05	4.90
Antimony (Asiatic), N. Y.	14.00	14.00	14.00	14.00

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
Sept. 5, 1939	2.236c. a Lb.	$20.61 a Gross Ton	$15.62 a Gross Ton
One week ago	2.236	20.61	15.62
One month ago	2.236	20.61	15.42
One year ago	2.300	19.61	14.42

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

Based on average for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel — High	Finished Steel — Low	Pig Iron — High	Pig Iron — Low	Steel Scrap — High	Steel Scrap — Low
1939	2.286c., Jan. 3	2.236c., May 16			$15.62, Aug. 29	$14.08, May 16
1938	2.512c., May 17	2.211c., Oct. 18	$23.25, June 21	$19.61, July 6	15.00, Nov. 22	11.00, June 7
1937	2.512c., Mar. 9	2.249c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 10
1936	2.249c., Dec. 28	2.016c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.062c., Oct. 1	2.056c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29
1934	2.118c., Apr. 24	1.945c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.953c., Oct. 3	1.792c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.915c., Sept. 6	1.870c., Mar. 15	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.981c., Jan. 13	1.883c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.192c., Jan. 7	1.962c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.223c., Apr. 2	2.192c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.192c., Dec. 11	2.142c., July 10	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 9

. . . THIS WEEK'S MARKET NEWS . . .

NEW BUSINESS

. . . Inquiries more active . . . Export demand expected to be important factor

SOME quickening in steel inquiries has occurred since the opening of general hostilities in Europe. At PITTSBURGH actual steel demand, with the exception of the Labor Day holiday, is at precisely the same levels as a week ago except that a stronger demand is noted from automotive centers. Steel consumers, whose inventories are abnormally low with relation to their own current production schedules, are likely to increase their flow of specifications to the mills, especially those involving low priced sheet tonnages.

It is practically certain that a step-up in export requirements involving especially semi-finished steel and pig iron will materialize in the near future. Support to American steel producers is also anticipated from consuming sources outside of the United States who heretofore have depended upon Great Britain and Germany for their supplies. A materialization of these factors in the face of strong domestic demand will of course accentuate production and delivery problems.

Heavier orders in the alloy and flat rolled steel divisions have featured the CLEVELAND and YOUNGSTOWN markets recently. August totals in all departments except wire were ahead of July, and some items like tubular goods experienced the best month in almost two years. Aggregate shipments by CLEVELAND and YOUNGSTOWN mills were the heaviest since September, 1937.

August was a good month for CHICAGO steel sellers. In comparison with July, specifications in one office increased over 30 per cent and would have been over 50 per cent better had two unusually large orders been included. In no case were bookings less than the previous month. Automobile releases in CHICAGO as elsewhere were an important supporting factor but the broad underlying base furnished by miscellaneous demand of great diversification provided a strong foundation.

The European war thus far has had little effect on business in CHICAGO, the major protective action being taken in pig iron, and this to a limited extent. A vast increase in American business generally is considered certain if the war continues for any length of time but demand on CHICAGO steel mills is not expected to reflect this influence soon. Sellers point to South America as a huge market which the United States has shared with Germany and England. Today, however, South American needs can be satisfied only in this country.

The Healy Subway Construction Corp. has been awarded definitely the contracts for two sections of the CHICAGO subway while the award of a third section to M. J. Boyle & Co. awaits only PWA approval. The Chicago Elevated Lines is asking bids on 1000 steel subway-elevated cars, the 800 cars for the North Western have been advertised and General American Transportation Co. will get underway soon the construction of 700 cars for the Chesapeake & Ohio at its East Chicago, Ind., plant.

A flurry of inquiries for ferromanganese and an effort by a few consumers to seek contracts as a hedge against possible higher prices followed the outbreak of hostilities in Europe.

Lake Superior iron ore shipments in August were highest of any month since September, 1937, bringing the cumulative total up to Sept. 1 this year some 3,000,000 tons in excess of the movement for the entire 1938 season.

The main concern of Pacific Coast plants is to ship existing orders before a threatened dock strike ties up all coast ports. Several thousand tons of steel are expected to be required in fulfilling recently awarded contracts for Navy Department work at Pearl Harbor, T. H., and Sitka and Kodiak Island, Alaska. The work, which is to be carried out on a cost plus basis, totals approximately $27,000,000.

The Bureau of Supplies, Navy Department, will open bids on Sept. 22 for 1662 tons of medium plates, sheets and strips for replacement of vessels.

PIG IRON

. . . Domestic demand increasing . . . Export trade expected to be a factor

IT is still too early to report on the pig iron export situation that may eventually develop as a result of war in Europe. The immediate outlook for exports of pig iron is complicated by the uncertainty of ship chartering.

Domestic orders and shipments of pig iron have gained sharply, however, in the past several days, partly as a result of war scare and partly because some furnaces have insisted that all low-priced business on their books be taken out by the end of September.

In the NEW YORK market sellers report that there have been large coverages in the latter part of last week and on Tuesday of this week. In a market that has become accustomed to spot business in carlots, orders of several thousand tons have been received. Much of this business is for water shipment and will hardly get started before the fourth quarter, in effect carrying over present prices to that quarter.

In the PHILADELPHIA district current deliveries are considerably above those of a month ago, and most sellers look for additional improvement in September. The price structure is quite firm, and there even is some talk of a movement upward of $1 for fourth quarter; this talk, however, has so far assumed little significance. The start of European hostilities has resulted in additional foreign inquiry, although little of this tonnage has been placed. Considerable business from Europe is looked for, however. The Swedeland furnace, which was scheduled to blow out for repairs will continue to operate for some time.

At CLEVELAND, August shipments exceeded the July volume and, in the case of one producer, the gain was around 20 per cent. Foundry coke deliveries also increased. Foundries catering to the motor truck industry have been buying well while heavier railroad purchases are expected in September and October. Sellers at CLEVELAND report an increased disposition on the part of consumers to get under contract.

While hand-to-mouth buying at PITTSBURGH continues, individual tonnages in some cases are slightly larger. When the real import of current European news is realized, it is expected that many consumers will be more liberal in their pig iron requirements to pig iron producers. Meanwhile, shipments at PITTSBURGH are changed but little from a week ago and have only been affected slightly by the Labor Day shutdown.

Shipments of pig iron to melters in the ST. LOUIS area during August were quite heavy, one of the best months of 1939, and the prospects are for an even heavier movement in September, as consumers will strive to cover on all contracts before expiration at the

end of the third quarter. Fourth quarter books are expected to be opened momentarily.

With automotive foundries tending to improve their melt, the August shipment of pig iron was up a trifle over that of July in the CINCINNATI area. Machine tool foundries continue to hold first place in operations.

Neither the market nor operations show much variation at BIRMINGHAM. The active blast furnace total continues at 14.

Chicago pig iron sellers found numerous orders awaiting their return from the holiday Tuesday morning. Consumers without stocks or contracts are making contracts at present prices. A price increase is expected for fourth quarter. Export cables seeking tonnages at $21 have been turned down, but at this writing no incentives are being offered from abroad. Meanwhile, domestic business continues good with August shipments exceeding those of July by a comfortable margin, and September expected to show a further rise. Producers' inventories are still large but heavy protracted demand might consume available stocks in six weeks, at current operating figure.

While producers of ferromanganese have made no announcement regarding the fourth quarter price, they are studying the situation closely in the light of probable effects of the war on imports of manganese ore. Ore costs probably will be higher, pointing to the possibility of higher quotations on ferromanganese. It is probable that no price announcement will be made for a week or 10 days to afford time for a more thorough appraisal of possible ore and transportation costs.

PRICES

. . . Hot rolled sheet base may be advanced $2 a ton . . . Export quotations strengthen

FOURTH quarter price announcements, with no general price increases anticipated, are expected this week or next. A revision in the base price of hot rolled sheets to the extent of $2 a ton upward is looked for. Such a move will tend to equalize pricewise certain gages of hot rolled single pickled annealed sheets with certain gages of cold rolled mill run sheets. Revision is also anticipated in the pickling extras for extremely light gages of hot rolled single pickled annealed. This expected change, if and when it occurs, will clarify the border line between certain single pickled annealed gages and mill run cold rolled sheets.

Meanwhile, steel producers are not selling steel for fourth quarter delivery until announcement of fourth quarter prices. In no cases are mills quoting customers for delivery beyond the end of this year. A drive is being made on consumers whose last May commitments are not yet completed, and steel producers are demanding that these specifications be in their hands as soon as possible for shipment at mills' convenience. Exports prices on steel have been stiffened to a point where they are nearly on a parity with domestic published prices. Heretofore realized export prices have in some cases been below domestic published prices. The current European situation, plus the strong domestic picture, is rapidly cleaning up the entire price structure with every indication of full published prices ruling all new business.

There is talk in some quarters of a $1 a ton price advance on pig iron for the fourth quarter, but consideration of this matter appears too tentative. Export prices for pig iron have already risen. Offers of $21 a ton have been received at CHICAGO. Ferromanganese prices probably will be higher, but price announcements may be wtihheld for a week or two pending clarification of the manganese ore shipping situation.

STEEL OPERATIONS

. . . Allowing for Labor Day shutdowns, this week's rate is 59 per cent

THE effect of Labor Day shutdowns on the weekly average of steel ingot production was negligible. This week's rate is estimated at 59 per cent compared with 63½ per cent last week, but the activity which began in steel plants on Tuesday indicated that the remainder of the week and next week would establish a rate higher than that of last week.

At Pittsburgh the drop this week was estimated at five points to 53 per cent, while the nearby Wheeling-Weirton district was down six points to 78 per cent. This week's output in the Cleveland-Lorain district is estimated at 70 per cent, down 11 points from last week, while Youngstown's loss was smaller, only three points to 53 per cent. This small decline was due to the fact that one producer was not only unaffected by the holiday but increased operations sharply. In the Chicago district the rate this week is down three and a half points to 51 per cent.

Other districts were also affected by the holiday, but indications point to a sharp recovery which may bring the country's average to around 65 per cent next week.

RAILROAD BUYING

. . . C. & O. orders 2500 freight cars . . . Chicago Rapid Transit Co. inquires for 1000 cars

THE Chesapeake & Ohio announced Aug. 31, the allocation of 2500 new freight cars as follows: to Greenville Steel Car Co., 100 50-ton low-side drop end gondolas with wooden floors; to American Car & Foundry Co., 400 50-ton low-side drop end gondolas with steel floors and 500 50-ton hopper coal cars; to Pullman-Standard Car Mfg. Co., 650 50-ton hopper coal cars; to General American Transportation Corp., 700 50-ton hopper coal cars; to Ralston Steel Car Co., 150 50-ton hopper coal cars. The awards were made much quicker than expected, for the road originally announced that bids would close Sept. 11. In addition to the new freight cars mentioned above, the Chesapeake & Ohio is in the market for 2500 tons of steel for freight car repairs. The Delaware & Hudson is inquiring for 1000 steel hopper cars.

The Chicago Rapid Transit Co. has asked car builders for estimates on the cost of 1000 all-steel or metal cars, and for a detailed method of financing the cars. Cars are to be of high tensile steel alloys and other strong light weight material. The company desires to obtain a car far superior in appearance, appointments, and operation to any other elevated or subway car. Motor cars must be capable of bringing eight loaded cars to at least 50 miles an hour. The alternate proposals sent out asked for prices on 100 to 1000 cars, half in each case to be motor cars.

The Pittsburgh Railways Co. has been authorized to buy 100 streamlined street cars to cost $1,500,000. The St. Louis Car Co. will build the bodies; Westinghouse Electric Co. will supply controls and motors for 75 of the cars and General Electric Co. those for the other 25. Westing-

house Air Brake Co. will furnish brakes.

The Colorado Fuel & Iron Corp., Denver, has been awarded a $172,592,69 contract by the Bureau of Reclamation for 3422 tons of rails, together with tie plates, spikes, angle bars, bolts and nuts, for relocation of the Southern Pacific Railroad around Shasta Dam, Central Valley project, California. Other awards made for this operation included those to the P. & M. Co., Chicago, $12,744.12 for more than 50,000 pieces of anticreepers and the Pettibone-Mulliken Corp., Chicago, $10,920.15 for switches, frogs and guard rail frogs.

The Bureau of Supplies and Accounts, Navy Department, will open bids Sept. 8 for two 100,000-lb. steel sheathed and one 100,000-lb. steel underframe railroad cars for the Naval Ammunition depot at St. Julien's Creek, Va.

On Sept. 19 the Bureau of Supplies and Accounts will open bids on cars. One schedule provides for alternate bids on 12, 13, 14 or 15 50-ton steel underframe cars and on eight 50-ton steel gondolas for the Norfolk, Va., Navy Yard. Another asks for bid on one 50-ton all-steel, wood-sheathed box car.

The Baldwin Locomotive Works has received an order from the Boston and Maine Railroad covering two steam locomotives of the 4-8-2 type for freight service. The new locomotives will be practically duplicates of five which were built by Baldwin for this railroad in 1937.

Bureau of the Census figures show that during the first quarter of this year 194 mining and industrial locomotives, valued at $905,424, were shipped by manufacturers. Locomotives shipped within the United States totaled 88 units valued at $544,844 while locomotives shipped abroad totaled 106 valued at $360,580.

SHEETS AND STRIP

. . . Specifications have increased sharply

THERE is a possibility that flat rolled prices for fourth quarter delivery will be announced this week or next. While no general increase is expected at that time, an adjustment in the base price of hot rolled sheets may occur. Such an adjustment might amount to $2 a ton in the base price of hot rolled sheets which would put certain gages of single pickled annealed hot rolled sheets on a price parity with mill run cold rolled sheets. Such a move, however, if it is made, would be more in the nature of a revision rather than an actual increase and would tend to clarify the border line between certain gages of hot and cold rolled sheets.

Sheet sales at PITTSBURGH, as well as hot and cold rolled strip specifications, have continued at recent levels in the past week, being influenced but slightly by the Labor Day holiday. Miscellaneous demand is holding well while a consistent but slow increase in automobile orders is noted. Effects of the European situation are expected to expedite the activity of domestic consumers rather than curtail such buying. August sheet orders ran from 25 to 35 per cent ahead of the July volume.

Releases against blanket tonnages at CLEVELAND toward the close of August became heavier. Cold rollers supplying the antomotive industry, makers of truck bodies, and numerous other lines became increasingly active. Considerable gratification has been expressed by producers over the increasingly firm tone to galvanized sheet prices.

At CHICAGO also, releases during August of low priced sheets and strip increased considerably over the previous month. Greater activity among makers of motor cars was chiefly responsible for the better showing, but the maintenance of a large volume of miscellaneous orders also was an important factor.

Sheet demand in the CINCINNATI area jumped sharply during the past week to almost 100 per cent of mill capacity. This was as result of a requirement on the part of the American Rolling Mill Co. that all orders for third quarter shipments must be in by Sept. 1. Automotive ordering is up definitely and miscellaneous demand is tending to broaden. Galvanized demand continues to be unusually heavy for this period of the year. Some requests for rush delivery on foreign orders was noted during the past week, but mill interests reported that shipping dates could not be met as required, yet these inquiries were hailed as the indicator of market trend following the beginning of hostilities in Europe.

Sales offices in the PHILADELPHIA district report an August volume of new business only slightly above the July total. The past few days, however, have witnessed a flurry of inquiry credited both to a strengthening of price undertone and a fear that the European war may in some way delay domestic deliveries. Some mills still have considerable low-price business on their books and do not look for complete liquidation until the end of the fourth quarter. In comparison, certain other mills, some of them being large producers, are striving to complete shipment of low-price tonnage by the end of this month.

SEMI-FINISHED STEEL

. . . Domestic orders expanding . . . Export buying expected

TOTAL demand has increased in the past week with the exception of the Labor Day holiday. Orders have been expanding due to increased activity at non-integrated sheet and strip mills. Total specifications in August ran about 15 per cent ahead of July volume. Because of the current European situation, there is every reason to believe that the semi-finished market may be affected by the possibility of increased export demand. Present published prices on semi-finished steel products are expected to be reaffirmed for fourth quarter delivery some time this week or next. Demand for wire rods is exceptionally strong.

Demand from forgers and users of wire rods, coupled with some export business, have highlighted the semi-finished market at CLEVELAND recently, enabling August to compare favorably with July.

WAREHOUSE BUSINESS

. . . Demand in good volume and widely diversified

CHICAGO steel warehouses are encouraged over the good showing during June, July and August, months when seasonal declines usually are seen. Such was not the case this year, all three months holding up well, which fact, being contra-seasonal, was tantamount to a gain. Demand is well diversified, with particular interest being shown in all types of sheets, narrow light strip, and hot rolled bars.

Warehouse business in ST. LOUIS was estimated to be about 5 per cent better in August than in July. There has been some activity in plates, shapes and bars, principally because most of the projects here have required only small tonnages.

The August books of warehouses in the PHILADELPHIA territory closed with a volume 10 to 15 per cent above the July total. For the most part stocks are only moderate, and new buying is of a replacement character rather than a rebuilding of stocks. Prices are unchanged.

WIRE PRODUCTS

. . . Sales to manufacturers, especially motor car companies, gain

SALES of manufacturers' wire at PITTSBURGH have expanded recently owing to direct and indirect demand from automobile makers. Miscellaneous requirements are also holding at recent levels.

STRUCTURAL STEEL

. . . Lettings light at 9250 tons . . . Inquiries total only 6500 tons

AWARDS of fabricated structural steel projects, as reported to THE IRON AGE, totaled only 9250 tons in the past week, while new projects in the market for bids were also at a low figure—6550 tons.

Structural steel fabricators are becoming somewhat alarmed over the scarcity of worthwhile tonnages on which to estimate. The only sizable new project reported is 1000 tons for a power house in Washington for the Potomac Electric Power Co.

PLATES

. . . Renewed activity noted in Eastern Pennsylvania . . . Car programs to be a factor

AFTER several weeks of slackening interest, the plate market in the PHILADELPHIA district has within the past few days picked up considerable activity. Many consumers apparently wish to get orders in for forward protection against any delay in deliveries. So far, little new foreign inquiry has been received, but an expansion in this direction is looked for by most mills in the near future. Current prices are quite firm.

The 800-car inquiry of the Chicago & North Western is the largest pending project in the CHICAGO district, aside from three subway sections involving over 40,000 tons of liner plates. Some car repair programs are providing a little plate business.

REINFORCING BARS

. . . Awards total 9600 tons, including one of 3010 tons

REINFORCING bar awards are curently making a fairly good showing as compared with fabricated structural steel. Lettings in the week totaled 9610 tons, including 3010 tons for the U. S. Indian Service at Parker, Ariz., awarded to the Pacific States Steel Corp.; 2865 tons for river channel improvements at Los Angeles awarded to the Bethlehem Steel Co., and 1500 tons for a sewage treatment plant at Fort Wayne, Ind., awarded to the Truscon Steel Co. Concrete bar prices appear to be much firmer.

MERCHANT BARS

. . . August orders well ahead of July bookings

THERE has been no tendency for hot rolled bar sales to decline at PITTSBURGH in the past week and the effect of Labor Day shutdowns has been negligible. Bookings remain well diversified with a noticeable increase in the volume of automotive releases. Shipments against third quarter contracts continue heavy and September bar production is expected to reach a high level. Bar specifications placed in August ran from 25 to 30 per cent ahead of July bookings. Present hot rolled bar prices are expected to be reaffirmed some time this week or next for fourth quarter delivery.

August specifications were up slightly over July in CHICAGO, the increase being accounted for to some extent by increasing activity among automobile parts makers. Other important buyers include the miscellaneous group, makers of machine tools, jobbers, forgers and tractor and farm implement plants.

At CLEVELAND orders during August held up very favorably in comparison with the preceding month, which was distinguished by good volume. Prospects for increased car building and repairing programs by the railroads are brighter than at any time this year.

IRON ORE

. . . Shipments to Aug. 31 top 1938 season's total

SHIPMENTS of Lake Superior iron ore are now well above the tonnage for the entire season of 1938. August deliveries totaled 6,954,580 gross tons, best monthly figure since September, 1937. In July shipments totaled 6,309,938 tons, and in August last year only 3,325,715 tons, according to the reports of the Lake Superior Iron Ore Association, Cleveland.

The cumulative total up to Sept. 1 this year is 22,495,767 tons, contrasted with 10,872,490 tons in the same period last season, and against 19,263,011 tons for the entire 1938 season.

TIN PLATE

. . . Increased demand expected to result from European situation

BECAUSE of Labor Day curtailments, tin plate production this week is estimated at 61 per cent, down five points from a week ago. Incoming business has eased off slightly but shipments remain at recent levels. With all can-makers' stocks at a minimum consistent with current requirements, increased demand growing out of the European situation would, in all probability, step up tin plate specifications sharply. There is a likelihood that an announcement regarding fourth quarter tin plate prices will be made soon, but there is no concrete evidence that the 25c. a base box reduction advocated by some consumers will materialize.

Weekly Bookings of Construction Steel

	Week Ended				Year to Date	
	Sept. 5, 1939	Aug. 29, 1939	Aug. 8, 1939	Sept. 7, 1938	1939	1938
Fabricated structural steel awards	9,250	13,000	19,505	26,510	674,825	518,735
Fabricated plate awards	1,640	950	8,050	120	112,470	96,020
Steel sheet piling awards	2,375	1,200	700	3,000	48,480	32,235
Reinforcing bar awards	9,610	8,900	5,395	9,520	325,270	218,965
Total Letting of Construction Steel..	22,875	24,050	33,650	39,150	1,161,045	865,955

IRON AND STEEL SCRAP

. . . Composite unchanged as three leading markets mark time, but No. 1 advances 75c. at Cleveland.

SEPT. 5—Most scrap markets have not yet reflected any reaction to the declaration of war in Europe other than the maintenance of a watchful waiting attitude. Prices are unchanged on the prime grades in all leading markets with the exception of Cleveland and Youngstown. At the former point, sales into consumption beginning Saturday have resulted in advances of 75c. a ton on melting grades, and the market went up 50c. to 75c. a ton on mill sales at Valley points. The same trend toward higher prices is also seen at Pittsburgh, where a small tonnage of special material, superior to dealers' No. 1 grade, was sold to a district mill at $17, 50c. over the regular No. 1 price, but in line with railroad heavy melting. THE IRON AGE composite price, which averages the No. 1 price at Pittsburgh, Chicago and Philadelphia, however, is unchanged this week at $15.62.

The export market is also awaiting further clarification. Great Britain is attempting to charter all available vessels, but it is by no means certain that any of these boats will be available for scrap cargoes. In fact, there has been cancellation of charters or this purpose within the last few days. Scrap buying prices for export are unchanged at the principal ports and no change can be expected until the shipping situation is under control.

Pittsburgh

Watchful waiting is the keynote of the market for the time being. Buyers are not disposed to "talk business" yet in terms of tonnage and price while sellers obviously are even more reticent. Current transactions involve brokers purchases, ranging between $16 and $16.50 for No. 1 heavy melting. A small tonnage of scrap practically equivalent to railroad quality has been picked up recently by a consumer in this district at around $17 a ton. Although this material is superior to dealer's No. 1 heavy melting, it probably portends a future trend in scrap prices. This particular sale was made within the range now quoted for railroad heavy melting. No. 1 heavy melting steel remains quotable at $16 to $16.50, unchanged from a week ago. There is some apprehension concerning domestic supplies of scrap in case ingot output rises materially over the next few months. That supplies are not over plentiful at today's prices is a fact, but it is also noted that large integrated steel mills are in a position to augment their supplies of scrap by blowing in additional blast furnaces which would affect steel production in three ways, namely, higher pig iron percentage in the melt, increased production of synthetic scrap, and the employment of duplex methods.

Philadelphia

The European war has naturally added additional srength to the already strong market prevailing here. Prices have, however, shown little change as yet inasmuch as the market is marking time in order to properly appraise the situation. One scrap boat left on Friday, probably for England, and a Japanese boat is expected in the latter part of this week. Brokers look for no embargo on scrap, but are somewhat concerned regarding the availability of ships to handle cargoes now being assembled. In the domestic market, all mills are taking shipments and are most interested in new commitments. The Budd Co. September list of 2800 tons of compressed bundles went, it is believed, to a broker, at an estimated price well above that ruling for the August list. This tonnage most likely will go into domestic consumption rather than for shipment abroad.

Buffalo

No new sales of scrap have been made this week. Prices remain firm. Despite the temporary decrease in operations, dealers are optimistic for the near future. Cast grades are still moving in fair quantity. The newly declared European war has yet to be analyzed as to its full influence on this market as well as others.

St. Louis

The scrap iron market is quiet, following the purchases of 16,000 tons, as reported in last week's issue of THE IRON AGE. The reaction to the war in Europe is mixed, country dealers being inclined to believe that there will be an immediate increase in price and are holding their scrap iron for higher prices, and St. Louis dealers feel that the reverse will be true. In the meantime, both interests are sitting tight, with local dealers going slow about covering their short interest made possible by the recent heavy sales.

Cincinnati

The local scrap market reflects the general uncertainty of the scrap situation throughout the counrty. Once the exact effects of the European war upon this country is apparent, the scrap interests feel there will be a steadying of the market and if possible increase in prices. Currently, dealers are reluctant to sell at present prices and the mills withhold commitments, bringing the market generally into pretty much of a stalemate so far as activity is concerned.

Chicago

Consumers, dealers and brokers at 11 a.m. Tuesday, Sept. 5, had no definite reactions to the European war situation. All were waiting to see how the wind would blow. The district's largest regular buyer Tuesday morning had not increased his offering price of $14 a gross ton delivered, and it was still possible to buy an odd car here and there for $13.75, so prices are unchanged.

Cleveland

A sale into mill consumption has established the market after two weeks of more or less nominal quotations during which time dealers gradually began offering more money for open-hearth scrap. No. 1 heavy melting is now quoted $15.25 to $15.75 per ton, an advance of 75c. Blast furnace grades are stronger also, reflected by an advance of 25c. in published quotations. It is understood the fresh buying of heavy melting began last Saurday. The mill decision to enter the market proved timely for most dealers as orders had begun to run out. Operations of open hearths continue at a high rate. The vessel movment of scrap has been brisk recently.

Youngstown

The market has been clarified by buying which started late last week. No. 1 heavy melting is quoted $15.75 to $16.25 and No. 2 is quoted $15 to $15.50, narrowing the normal spread between the two grades.

Detroit

Brokers report no change in buying prices. Lists offered this week went for prices as they have been for past few weeks.

New York

Further uncertainty has been created in the export market by the cancellation of charters, and pending clarification of the whole shipping situation, forward buying for export coverages is naturally being held up. Boats now in port are still being loaded, however. In the circumstances, the market maintains the status quo and there has been no change in buying prices one way or the other.

Boston

Since breaking out of hostilities in Europe the scrap trade has been more or less up in the air. Ship dealers are flooded with orders from Great Britain for ships of any type or condition, and there is great activity also in the charter market, all of which has somewhat complicated the exporter's position. However, exporters are buying material to ship from here and Providence, provided they obtain vessel space. The last boat from here sailed Aug. 30 with 7500 tons for England. Pittsburgh connections intimate to Boston firms mills will shortly enter the market for large tonnages.

Toronto

Canadian scrap markets were affected by general uncertainty during the week. Supply and demand as well as prices came in for much discussion and, while no action was taken toward revising lists and prices remained unchanged, prospects are favorable for early advances. Dealers look for upward revisions soon. Consumers, however, claim that under war status an embargo will be placed on the export of scrap and supplies will be more plentiful to domestic users. No. 1 heavy melting steel still is large, although there are good offerings of No. 2. Machinery cast is in small supply in local yards, with some improvement reported in demand. Steel mills are placing short term contract at old prices, although local dealers look for more extended commitments soon.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$16.00 to	$16.50
Railroad hvy. mltng...	17.00 to	17.50
No. 2 hvy. mltng. steel.	14.50 to	15.00
Scrap rails	17.00 to	17.50
Rails 3 ft. and under..	19.00 to	19.50
Comp. sheet steel	16.00 to	16.50
Hand bundled sheets..	15.00 to	15.50
Hvy. steel axle turn...	14.50 to	15.00
Machine shop turn....	10.00 to	10.50
Short shov. turn.....	12.50 to	13.50
Mixed bor. & turn....	9.25 to	9.75
Cast iron borings.....	9.25 to	9.75
Cast iron carwheels...	15.50 to	16.00
Hvy. breakable cast...	13.00 to	13.50
No. 1 cupola cast.....	15.75 to	16.25
RR. knuckles & cplrs.	18.50 to	19.00
Rail coil springs	20.00 to	20.50
Rail leaf springs	19.00 to	19.50
Rolled steel wheels....	19.00 to	19.50
Low phos. billet crops.	20.00 to	20.50
Low phos. punchings..	18.50 to	19.00
Low phos. plate (heavy)	18.50 to	19.50
Railroad malleable	16.50 to	17.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$16.50 to	$17.00
No. 2 hvy. mltng. steel.	14.50 to	15.00
Hydraulic bund., new..	16.00 to	16.50
Hydraulic bund., old..	12.50 to	13.00
Steel rails for rolling.	17.00 to	17.50
Cast iron carwheels...	16.00 to	16.50
Hvy. breakable cast...	16.00 to	16.50
No. 1 cast	16.50 to	17.00
Stove plate (steel wks.)	13.50 to	14.00
Railroad malleable ...	16.00 to	17.00
Machine shop turn....	10.00 to	10.50
No. 1 blast furnace....	6.50 to	7.00
Cast borings	6.50 to	7.00
Heavy axle turnings..	10.50 to	11.00
No. 1 low phos. hvy...	17.50 to	18.00
Couplers & knuckles..	17.50 to	18.00
Rolled steel wheels ...	17.50 to	18.00
Steel axles	20.00 to	20.50
Shafting	20.50 to	21.00
Spec. iron & steel pipe	13.00 to	13.50
No. 1 forge fire	12.00 to	12.50
Cast boring (chem.)...	9.50 to	10.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton	
Hvy. mltng. steel	$13.75 to	$14.00
Auto. hvy. mltng. steel alloy free	12.50 to	13.00
No. 2 auto steel	11.00 to	11.50
Shoveling steel	13.75 to	14.00
Factory bundles	12.75 to	13.25
Dealers' bundles	11.75 to	12.25
Drop forge flashings...	10.00 to	10.50
No. 1 busheling	12.50 to	13.00
No. 2 busheling, old...	5.75 to	6.25
Rolled carwheels	14.50 to	15.00
Railroad tires, cut	15.00 to	15.50
Railroad leaf springs..	14.50 to	15.00
Steel coup. & knuckles	14.50 to	15.00
Axle turnings	12.50 to	13.00
Coil springs	16.50 to	17.00
Axle turn. (elec.).....	13.50 to	14.00
Low phos. punchings..	15.50 to	16.00
Low phos. plates 12 in. and under	15.00 to	15.50
Cast iron borings	6.50 to	7.00
Short shov. turn.....	6.50 to	7.00
Machine shop turn....	6.50 to	7.00
Rerolling rails	18.00 to	18.50
Steel rails under 3 ft..	16.00 to	16.50
Steel rails under 2 ft..	16.50 to	17.00
Angle bars, steel	15.50 to	16.00
Cast iron carwheels ..	12.50 to	13.00
Railroad malleable	15.00 to	15.50
Agric. malleable	12.00 to	12.50

	Per Net Ton	
Iron car axles	$18.00 to	$18.50
Steel car axles	17.50 to	18.00
Locomotive tires	13.00 to	13.50
Pipes and flues	8.50 to	9.00
No. 1 machinery cast..	12.00 to	12.50
Clean auto. cast	12.50 to	13.00
No. 1 railroad cast....	11.00 to	11.50
No. 1 agric. cast	10.00 to	10.50
Stove plate	7.75 to	8.25
Grate bars	7.75 to	8.25
Brake shoes	9.50 to	10.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$15.75 to	$16.25
No. 2 hvy. mltng. steel.	15.00 to	15.50
Low phos. plate	17.00 to	17.50
No. 1 busheling	15.25 to	15.75
Hydraulic bundles	15.50 to	16.00
Machine shop turn....	9.00 to	9.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$15.25 to	$15.75
No. 2 hvy. mltng. steel.	14.25 to	14.75
Comp. sheet steel	15.00 to	15.50
Light bund. stampings	11.00 to	11.50
Drop forge flashings..	14.00 to	14.50
Machine shop turn....	8.00 to	8.50
Short shov. turn.	8.75 to	9.25
No. 1 busheling	14.00 to	14.50
Steel axle turnings....	10.50 to	11.00
Low phos. billet and bloom crops	18.50 to	19.00
Cast iron borings	8.75 to	9.25
Mixed bor. & turn.....	8.75 to	9.25
No. 2 busheling	8.75 to	9.25
No. 1 cupola cast	16.50 to	17.00
Railroad grate bars...	11.00 to	11.50
Stove plate	9.50 to	10.00
Rails under 3 ft.	18.50 to	19.00
Rails for rolling	18.25 to	18.75
Railroad malleable	16.50 to	17.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$14.50 to	$15.00
No. 2 hvy. mltng. steel.	12.50 to	13.00
Scrap rails	15.50 to	16.00
New hvy. b'ndled sheets	13.00 to	13.50
Old hydraul. bundles..	11.50 to	12.00
Drop forge flashings...	12.50 to	13.00
No. 1 busheling	12.50 to	13.00
Machine shop turn....	8.00 to	8.50
Shov. turnings	9.50 to	10.00
Mixed bor. & turn	8.00 to	8.50
Cast iron borings.....	8.00 to	8.50
Knuckles & couplers..	16.00 to	16.50
Coil & leaf springs....	16.00 to	16.50
Rolled steel wheels....	16.00 to	16.50
No. 1 machinery cast..	15.00 to	16.00
No. 1 cupola cast.....	14.50 to	15.00
Stove plate	12.00 to	12.50
Steel rails under 3 ft...	18.50 to	19.00
Cast iron carwheels...	14.50 to	15.00
Railroad malleable	15.00 to	15.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting..	$12.00 to	$12.50
No. 1 hvy. melting.....	12.25 to	12.75
No. 2 hvy. melting....	11.50 to	12.00
No. 1 locomotive tires.	13.25 to	13.75
Misc. stand. sec. rails.	14.50 to	15.00
Railroad springs	15.50 to	16.00
Bundled sheets	8.00 to	8.50
No. 1 busheling	7.50 to	8.00
Cast. bor. & turn.....	3.00 to	3.50
Machine shop turn....	4.50 to	5.00
Heavy turnings	9.00 to	9.50
Rails for rolling	17.00 to	17.50
Steel car axles	18.50 to	19.00
No. 1 RR. wrought....	9.75 to	10.25
No. 2 RR. wrought....	12.00 to	12.50
Steel rails under 3 ft..	15.50 to	16.00
Steel angle bars	13.50 to	14.00
Cast iron carwheels...	14.75 to	15.25
No. 1 machinery cast..	15.00 to	15.50
Railroad malleable	13.00 to	13.50
No. 1 railroad cast....	12.50 to	13.00
Stove plate	8.00 to	8.50
Grate bars	8.00 to	8.50
Brake shoes	9.50 to	10.00

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel.	$11.50 to	$12.00
No. 2 hvy. mltng. steel.	9.25 to	9.75
Scrap rails for mltng..	15.00 to	15.50
Loose sheet clippings..	7.00 to	7.50
Hydrau. b'ndled sheets	11.00 to	11.50
Cast iron borings	3.50 to	4.00
Machine shop turn....	4.75 to	5.25
No. 1 busheling	7.50 to	8.00
No. 2 busheling	2.50 to	3.00
Rails for rolling	17.00 to	17.50
No. 1 locomotive tires.	13.50 to	14.00
Short rails	17.75 to	18.25
Cast iron carwheels...	12.75 to	13.25
No. 1 machinery cast..	12.75 to	13.25
No. 1 railroad cast....	12.50 to	13.00
Burnt cast	6.75 to	7.25
Stove plate	6.75 to	7.25
Agricul. malleable	11.00 to	11.50
Railroad malleable	13.50 to	14.00
Mixed hvy. cast	11.25 to	11.75

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel.....	....	$13.00
Scrap steel rails	$13.50 to	14.00
Short shov. turnings...	....	7.50
Stove plate	....	9.50
Steel axles	....	18.50
Iron axles	....	18.50
No. 1 RR. wrought....	....	10.00
Rails for rolling	16.00 to	16.50
No. 1 cast	....	15.00
Tramcar wheels	14.50 to	15.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. industrial steel	$11.00 to	$11.50
No. 2 hvy. mltng. steel.	10.00 to	10.50
Borings and turnings..	5.75 to	6.25
Long turnings	5.75 to	6.75
Short shov. turnings...	6.50 to	7.00
No. 1 machinery cast..	13.00 to	13.50
Automotive cast	13.50 to	14.00
Hvy. breakable cast...	9.50 to	10.00
Stove plate	8.00 to	8.50
Hydraul. comp. sheets.	12.50 to	13.00
New factory bushel....	11.00 to	11.50
Sheet clippings	8.25 to	9.25
Flashings	10.50 to	11.00
Low phos. plate scrap.	12.00 to	12.50

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel.	$12.50 to	$13.00
No. 2 hvy. mltng. steel.	10.00 to	10.50
Hvy. breakable cast...	12.50 to	13.00
No. 1 machinery cast..	11.50 to	12.00
No. 2 cast	9.50 to	10.00
Stove plate	9.50 to	10.00
Steel car axles	15.00 to	15.50
Shafting	15.00 to	15.50
No. 1 RR. wrought....	11.00 to	11.50
No. 1 wrought long....	9.50 to	10.00
Spec. iron & steel pipe	9.00 to	9.50
Rails for rolling	16.00 to	16.50
Clean steel turnings*..	4.50 to	5.00
Cast borings*	3.50 to	4.00
No. 1 blast furnace....	3.50 to	4.00
Cast borings (chem.)..	9.50 to	10.00
Unprepared yard scrap	6.00 to	6.50
Light iron	3.00 to	3.50

Per gross ton, delivered local foundries:

No. 1 machn. cast†....	$13.50 to	$14.00
No. 2 cast†	10.50 to	11.00

* $1.50 less for truck loads.
† Northern N. J. prices are $2 to $2.50 higher.

BOSTON

Dealers' buying prices per gross ton:

Breakable cast	$10.50 to	$10.75
Machine shop turn....	4.90 to	5.15
Mixed bor. & turn.....	....	2.25
Bun. skeleton long	8.00 to	8.15
Shafting	....	16.15
Cast bor. chemical.....	5.00 to	6.00

Per gross ton delivered consumers' yards:

Textile cast	$14.00 to	$14.50
No. 1 machine cast....	13.50 to	14.50

Per gross ton delivered dealers' yards:

No. 1 hvy. mltng. steel.	$12.00 to	$12.50
No. 2 steel	10.50 to	11.00

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$13.00 to	$13.50
No. 2 hvy. mltng. steel.	12.50 to	13.00

CANADA

Dealers' buying prices at these yards, per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng. steel.	$9.25	$8.75
No. 2 hvy. mltng. steel.	8.00	7.50
Mixed dealers steel....	6.75	6.25
Drop forge flashings...	8.25	7.75
New loose clippings...	4.25	3.75
Busheling	3.75	3.25
Scrap pipe	4.25	3.75
Steel turnings	4.25	3.75
Cast borings	3.75	3.25
Machinery cast	14.00	13.50
Dealers cast	12.00	11.50
Stove plate	8.00	7.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges

No. 1 hvy. mltng. steel.	$12.50 to	$13.00
No. 2 hvy. mltng. steel	11.00 to	11.50
No. 2 cast	10.50 to	11.00
Stove plate	9.50 to	10.10

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	$14.00 to	$14.25
No. 2 hvy. mltng. steel.	13.00 to	13.25
Rails (scrap)	14.00 to	14.25

Philadelphia, delivered alongside boats, Port Richmond.

No. 1 hvy. mltng. steel.	$15.75 to	$16.00
No. 2 hvy. mltng. steel.	14.50 to	14.75

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

Steel prices on these pages are base prices only and f.o.b. mill unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases the amount of freight which must be absorbed in order to meet competition.

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh ... ago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are $2 higher. F.o.b. Duluth, billets only, $2 higher.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Gross Ton
Pittsburgh, Chicago or Cleveland	$43.00
Worcester, Mass.	45.00
Birmingham	43.00
San Francisco	52.00

Rods over 9/32 in. or 47/64 in., inclusive, $5 a ton over base.

SOFT STEEL BARS

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham	2.15c.
Detroit, delivered	2.25c.
Duluth	2.25c.
Philadelphia, delivered	2.47c.
New York	2.49c.
On cars dock Gulf ports	2.50c.
On cars dock Pacific ports	2.75c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.00c.
On cars dock Tex. Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt.	1.90c.
Detroit, delivered	2.00c.
On cars dock Tex. Gulf ports	2.25c.
On cars dock Pacific ports	2.35c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham	1.80c.
Detroit, delivered	1.90c.
On cars dock Tex. Gulf ports	2.15c.
On cars dock Pacific ports	2.25c.

IRON BARS

Chicago and Terra Haute	2.15c.
Pittsburgh (refined)	3.60c.

COLD FINISHED BARS AND SHAFTING*

Pittsburgh, Buffalo, Cleveland, Chicago, and Gary	2.65c.
Detroit	2.70c.

* In quantities of 10,000 to 19,999 lb.

PLATES

	Base per Lb.
Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del.	2.10c.*
Philadelphia, del'd	2.05c. to 2.15c.
New York, del'd	2.19c. to 2.29c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.60c.
Wrought iron plates, P'tg	3.80c.

* Subject to concessions, particularly in the East, of $2 a ton.

FLOOR PLATES

Pittsburgh or Chicago	3.35c.
New York, del'd	3.71c.
On cars dock Gulf ports	3.70c.
On cars dock Pacific ports	3.95c.

STRUCTURAL SHAPES

	Base per Lb.
Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham	2.10c.
Philadelphia, del'd	2.215c.
New York, del'd	2.27c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

STEEL SHEET PILING

	Base per Lb.
Pittsburgh, Chicago or Buffalo	2.40c.
On cars dock Gulf ports	2.85c.
On cars dock Pacific ports	2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$40.00
Angle bars, per 100 lb.	2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton	$40.00
Light rails (from rail steel) per gross ton	39.00

	Base per Lb.
Cut spikes	3.00c.
Screw spikes	4.55c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast ports	2.25c.
Track bolts, to steam railroads	4.15c.
Track bolts to jobbers, all sizes (per 100 counts)	65-5

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

Hot Rolled

	Base per Lb.
Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago	2.00c.
Detroit, delivered	2.10c.
Philadelphia, delivered	2.17c.
Granite City	2.10c.
On cars dock Pacific ports	2.50c.
Wrought iron, Pittsburgh	4.10c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago	3.05c.
Detroit, delivered	3.15c.
Granite City	3.15c.
Philadelphia, delivered	3.37c.
On cars dock Pacific ports	3.65c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

From May 10 up to and including May 15, reductions from the base price of hot and cold rolled sheets running from $4 to $8 a ton were prevalent. Concessions withdrawn, on May 15.

Subsequent to May 15, many orders originally placed at $4 to $6 below the base price were adjusted to the full $8 concession.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham	3.50c.
Philadelphia, delv'd	3.67c.
Granite City	3.60c.
On cars dock Pacific ports	4.00c.
Wrought iron, Pittsburgh	6.10c.

Electrical Sheets
(F.o.b. Pittsburgh)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extra plus 25c per 100 lb. for coils. Pacific ports add 70c. a 100 lb

Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary	3.80c.
F.o.b. cars dock Pacific ports	4.50c.

Vitreous Enameling Stock, 20 Gage*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland	3.35c.
Detroit, delv'd	3.45c.
Granite City	3.45c.
On cars dock Pacific ports	3.95c.

TIN MILL PRODUCTS

***Tin Plate**

	Per Base Box
Standard cokes, Pittsburgh, Chicago and Gary	$5.00
Standard cokes, Granite City	5.10

* Prices effective Nov. 10 on shipments through first quarter of 1939.

Special Coated Manufacturing Ternes

	Per Base Box
Granite City	$4.40
Pittsburgh or Gary	4.30

Roofing Terne Plate
(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)	
8-lb. coating I.C.	$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.00
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

Black Plate, 29 gage and lighter

Pittsburgh, Chicago and Gary	3.05c.
Granite City	3.15c.
On cars dock Pacific ports, boxed	4.00c.

HOT ROLLED STRIP

(Widths up to 12 in.)

	Base per Lb
Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham	2.00c.
Detroit, delivered	2.10c.

Cooperage Stock

Pittsburgh & Chicago	2.10c.

From May 10 up to and including May 15, reductions in the base price of hot rolled strip running from $4 to $8 a ton were prevalent Concessions withdrawn on May 15.

Subsequent to May 15, many orders originally placed at $4 to $6 below the base price were adjusted to the full $8 concession.

COLD ROLLED STRIP*

	Base per Lb
Pittsburgh, Youngstown or Cleveland	2.80c.
Chicago	2.90c.
Detroit, delivered	2.90c.
Worcester	3.00c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown, or Cleveland	2.95c.
Detroit, delivered	3.05c.
Worcester	3.35c.

From May 10 up to and including May 15, reductions from the base price of cold rolled strip amounting to $4 a ton were prevalent. Concessions withdrawn on May 15.

COLD ROLLED SPRING STEEL

		Pittsburgh and Cleveland	Worcester
Carbon	0.26-0.50%	2.80c.	3.00c.
Carbon	0.51-0.75	4.30c.	4.50c.
Carbon	0.76-1.00	6.15c.	6.35c.
Carbon	1.01-1.25	8.35c.	8.55c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

* On galvanizing wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

	Base per Keg
Standard wire nails	$2.40
Coated nails	2.40
Cut nails, carloads	3.60
	Base per 100 Lb.
Annealed fence wire	$2.90
Galvanized fence wire	3.30
Polished stapies	3.10
Galvanized staples	3.35
Twisted barbless wire	3.25
Woven wire fence, base column.	67
Single loop bale ties, base col...	56
Stand. 2 pt., 12.5 gage barbed cattle wire, per 80 rod spool...	$2.58
Stand. 2 pt., 12.5 gage barbed hog wire, per 80 rod spool....	$2.76

Note: Birmingham base same on above items, except spring wire.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel			*Wrought Iron*		
In.	Black	Galv.	In.	Black	Galv.
⅛	56	36	¼ & ⅜	+9	+30
¼ to ⅜	59	43½	½	24	6½
½	63½	54	¾	30	13
¾	66½	60½	1 & 1¼	34	19
1 to 3	68½	60½	1½	38	21½
			2	37½	21

Lap Weld

2	61	52½	2	30½	15
2½ & 3	64	55½	2½ to 3½	31½	17½
3½ to 6.66		57½	4	33½	21
7 & 8.65		55½	4½ to 8.32	1½	20
9 & 10.64	1½	55	9 to 12	28½	15
11 & 12.63	1½	54			

Butt weld, extra strong, plain ends

⅛	54½	41½	¼ & ⅜	+10	+43
½ to ⅜	56½	45½	½	25	9
½	61½	37½	¾	31	15
¾	65½	57½	1 to 2	38	22½
1 to 3	67	60			

Lap weld, extra strong, plain ends

2	59	51½	2	33½	18½
2½ & 3	63	55½	2½ to 4.39½		25½
3½ to 6.66	1½	59	4½ to 6.37½		24
7 & 8.65	1½	56	7 & 8	38½	24½
9 & 10.64	1½	55	9 to 12	32	20½
11 & 12.63	1½	54			

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount of $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher, on all butt weld 8 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall. (Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld Hot Rolled
1 in. o.d. 13 B.W.G.	$ 9.01	$ 7.82	....
1¼ in. o.d. 13 B.W.G.	10.67	9.26	....
1½ in. o.d. 13 B.W.G.	11.70	10.23	$9.72
1¾ in. o.d. 13 B.W.G.	13.42	11.64	11.06
1 in. o.d. 13 B.W.G.	15.03	13.04	12.38
1¼ in. o.d. 13 B.W.G.	16.76	14.54	13.79
1½ in. o.d. 12 B.W.G.	18.45	16.01	15.16
2 in. o.d. 12 B.W.G.	20.21	17.54	16.58
2¼ in. o.d. 12 B.W.G.	21.42	18.59	17.54
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3½ in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66
4½ in. o.d. 10 B.W.G.	43.04	37.35	35.22
5 in. o.d. 9 B.W.G.	54.01	46.87	44.25
6 in. o.d. 7 B.W.G.	82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	30%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

Per Net Ton

*6-in. and larger, del'd Chicago.	$51.00
6-in. and larger, del'd New York	49.00
*6-in. and larger, Birmingham.	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles....	52.00
F.o.b dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, $3 extra 4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $42, Birmingham, and $5 delivered Chicago and 4-in. pipe, $45, Birmingham, and $54 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
½ in. and 6 in. and smaller....	68½
Larger and longer up to 1 in..	66
1⅛ in. and larger	64
Lag bolts	66
Plow bolts, Nos. 1, 2, 3, and 7	68½
Hot pressed nuts, and c.p.c. and t-nuts, square or hex. blank or tapped:	
½ in. and smaller	67
9/16 in. to 1 in. inclusive....	64
1⅛ in. and larger	62

On the above items with the exception of plow bolts, there is an additional allowance of 10 per cent for full container quantities.

On all of the above items there is an additional 5 per cent allowance for carload shipments.

	U.S.S.	S.A.E.
Semi-fin. hexagon nuts		
½ in. and smaller	67	70
9/16 to 1 in.	64	65
1⅛ in. and larger	62	62

In full container lots, 10 per cent additional discount.

Stove bolts in packages, nuts attached	72½
Stove bolts in packages, with nuts separate	72½ and 12½
Stove bolts in bulk	84

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½ in. and larger)

Base Per 100 Lb.

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $3.40

Small Rivets

(7/16 in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland Chicago, Birmingham ...65 and 10

Cap and Set Screws

(Freight allowed to destination)

Per Cent Off List

Milled hexagon head, cap screws, 1 in. dia. and smaller	50 and 10
Milled headless set screws, cut thread ¾ in. and smaller	70
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	75
Upset set screws, cup and oval points	77½
Milled studs	60

Alloy Steel

Alloy Steel Blooms, Billets and Slabs

F.ob. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, $56.00 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base ..... 2.70c.

Delivered, Detroit ..... 2.80c.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
200 (½% Nickel)	$0.35
2100 (1½% Nickel)	$0.75
2300 (3½% Nickel)	1.55
2500 (5% Nickel)	2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.85
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4340 Chr.-Ni.-Mo.	1.65
4345 Chro.-Ni.-Mo.	1.55
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
6100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.35
Chromium-nickel vanadium	1.50
Carbon-vanadium	0.35

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.35c. base per lb. Delivered Detroit, 3.45c., carlots

STAINLESS & HEAT RESISTANT ALLOYS

(Base prices, cents per lb. f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot stp.	17c.	17.50c.	24c.	35c.
Cold stp.	22c.	22.50c.	32c.	52c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	42c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	Nominal
Tin plate, per base box	20s. 3d. to 21s.
Steel bars, open hearth	£10 8s.
Beams, open hearth	£10
Channels, open hearth	£10 5s.
Angles, open-hearth	£10
Black sheets, No. 24 gage	£13
Galvanized sheets, No. 24 gage	£15 15s.

CONTINENTAL

Per Gross Ton, Gold £, f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet Bars	Nominal
Plate ¼ in. and up	£5 7s.
Plate 3/16 in. and 5 mm.	£5 13s.
Sheet ⅛ in.	£5 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 12s.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$22.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	22.00
Delivered Brooklyn	24.50
Delivered Newark or Jersey City	23.53
Delivered Philadelphia	22.84
F.o.b. Neville Island, Erie, Pa. Toledo, Chicago, Granite City, Cleveland and Youngstown	21.00
F.o.b. Buffalo	21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati	21.06
Northern, delivered, Cincinnati	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	19.00
Delivered, San Francisco, Los Angeles or Seattle	24.50
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	$21.50
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	20.50
Delivered Philadelphia	22.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Buffalo	$22.00
F.o.b. Everett, Mass.	23.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Newark or Jersey City	24.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$26.50

Gray Forge

Valley or Pittsburgh furnace	$20.50

Charcoal

Lake Superior furnace	$25.00
Delivered Chicago	28.34

Canadian Pig Iron

Per Gross Ton

Montreal	
Foundry iron	$24.50 base
Malleable	25.00 base
Basic	24.50 base
Toronto	
Foundry iron	$22.50 base
Malleable	23.00 base
Basic	22.50 base

On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $80.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$28.00
Domestic, 26 to 28%	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)	$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50% $30.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50% $24.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton. The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-Manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	$83.00
2.50% carbon	88.00
2% carbon	93.00
1% carbon	103.00

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	$1.75
Ferrotungsten, 100 lbs. and less	2.00
Ferrovanadium, contract, per lb. contained V., delivered	$2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., ton lots	$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, $3 unitage, freight equalized with Nashville	$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.
Molybdenum oxide briquettes 48-52% Mo; per lb. contained Mo, f.o.b. Langeloth, Pa.	80c.

* Spot prices are $5 per ton higher.
† Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Messabi, Bessemer, 51.50%	5.10
Messabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria	12c.
Iron, low phos., Swedish, average, 68½% iron	12c
Iron, basic or foundry, Swedish, aver. 65% iron	10½c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	29c.
Man., African, Indian, 44-48%	25c.
Man., African, Indian, 49-51%	30c.
Man., Brazilian, 46 to 48%	27c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	$18.00
Tungsten, domestic, scheelite delivered	$16.00 to $17.00
Chrome or (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	$15.00
Rhodesian, 45%	19.00
Rhodesian, 48%	22.00
Turkish, 48-49%	22.50
Turkish, 45-56%	19.50
Turkish, 40-41%	17.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	$24.00
48-49%	22.50

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$16.00 to $17.00
Domestic, f.o.b. Ohio River landing barges	$16.50 to 17.50
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines	$17.00 to 18.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	$21.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	$21.50

FUEL OIL

Per Gal.

No. 2, f.o.b. Bayonne, N. J.	4.00c.
No. 6, f.o.b. Bayonne, N. J.	2.50c.
No. 5 Bur. Stds., del'd Chicago	3.25c.
No. 6 Bur. Stds., del'd Chicago	2.75c
No. 3 distillate, del'd Cleve'd.	5.375c.
No. 4 industrial, del'd Cleve'd.	5.125c.
No. 5 industrial, del'd Cleve'd.	3.75c
No. 6 industrial, del'd Cleve'd.	3.50c.

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	$3.75
Foundry, f.o.b. Connellsville, freight	$4.75 to 5.50
Foundry, by-product Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.98
Foundry, by-product, delivered Cleveland	10.30
Foundry, by-product, delivered Cincinnati	9.75
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	10.75 to 11.00
Foundry, from Birmingham, f.o.b. cars dock Pacific ports	14.75

New Deal May Act to Prevent Profiteering by Curb on Prices

WASHINGTON — Even without the United States becoming a participant in the hostilities that have again broken out in Europe, the Roosevelt administration is studying means to prevent "profiteering."

That it would make this move was indicated by President Roosevelt in his neutrality broadcast last Sunday night. After a cabinet meeting on Monday, Attorney General Murphy said existing laws were "entirely inadequate" to check "profiteering" and that the President had instructed him to "take appropriate action." The remarks of the attorney general were taken to indicate that legislation will be asked for at the special session of Congress, which the President is expected to call at some indefinite date following his neutrality proclamation and the subsequent proclamation applying the neutrality law.

No Right to Profiteer

The unusual move to curb prices in peace-time is attributed to the Administration's apparent concern that demands for war materials from the United States by England and France will otherwise see zooming prices.

In his radio address the President said that "no American has the moral right to profit at the expense either of his fellow citizens or of the men, women and children who are living and dying in the midst of war in Europe."

While undoubtedly the President will have overwhelming public sentiment back of the warning against capitalizing on human suffering to "profiteer," there exists a suspicion in some quarters that "inside" New Dealers are seeking to take advantage of the war crisis to establish a tight system of economic planning. Unless this suspicion is removed, difficulty might be experienced in getting price control legislation in the absence of the United States becoming an active belligerent. Another question raised relates to what is meant by profiteering. Just at the present time export steel prices are lower than domestic prices and the industry maintains that prevailing levels are unprofitable. Should sharp demand for war steel develop, as seems inevitable if hostilities are prolonged, it is expected that prices will rise, though not to the point that was obtained during the World War prior to American entry.

Opportunities in Latin America

There have been reports that even existing machinery can be used by regulatory bodies to control prices. It is clear from the attorney general's statement that he does not accept this view.

Sharing with the Department of Justice in the study to control prices is the Department of Commerce. This was disclosed by Acting Secretary of Commerce Noble.

"It goes without saying," Mr. Noble declared, "that profiteering will be stifled as much as possible."

The effort to hold down prices was said by Mr. Noble to fit in with plans of the Department of Commerce to expand Latin American trade.

"We want to maintain the quality of our exports and keep prices on a level consistent, so far as possible, with peace-time conditions," said Mr. Noble.

"American industry has a big opportunity to expand its trade with Latin America and it would be good business sense to take the fullest advantage of it."

Nazis to Lose in South

The United States is the chief exporter to Latin America, Germany ranking second. It is the opinion of Mr. Noble that in view of the war, Nazi influence in Latin America will dwindle.

In movements of American goods to belligerents, pig iron, steel, and machinery will not be directly affected by the embargo under the Neutrality Act. The embargo applies only to arms, ammunition and implements of war—finished products. But to the extent that steel entered into these products it will be affected by the Neutrality Act. Revision of the act by raising the embargo is expected to be made by the President at a special session of Congress, permitting shipments of arms, ammunition and implements on a cash-and-carry basis in vessels of nations purchasing them.

Civil Liberties Union Offers "Help" to J. & L.

WASHINGTON—The American Civil Liberties Union, CIO adjunct, which specializes in baiting employers who do not come within its fold, has cast itself in the role of a brisk champion of the rights of a steel company, with which CIO's SWOC has a contract. The ACLU has directed a letter to Senator O'Mahoney, chairman of the Temporary National Economic Committee, protesting that the committee is attempting to inquire into the political, social and economic views of the Jones & Laughlin Steel Corp. This is being done, according to the ACLU, in a committee subpoena asking the company to produce its correspondence, telegrams and other records expressing the company's views, policies and activities regarding the anti-trust laws. The ACLU asked that the subpoena be withdrawn.

"The political, social or economic views of persons or corporations are matters which should be of no concern to the government," the letter said.

At the Department of Justice it has been stated that the J. & L. subpoena is identical with subpoenas directed to other large steel companies in connection with the forthcoming TNEC steel inquiry. It was declared that no effort is being made to get political views but rather the purpose is to get views for study respecting possible changes to the anti-trust laws.

Argentina Buys Railroad Equipment in Hungary

WASHINGTON—The Commerce Department's Transportation Division reports that Argentina has placed a $1,435,000 order for 10 streamlined diesel trains and seven single-motor diesel coaches from Metropolitan Rail Cars Ganxpatents, Ltda., Hungary. To be constructed in Hungary, although the company manufactures some of its products in England, the trains were authorized to be purchased without asking for public bids.

Payment on the equipment is reported to be 20 per cent cash and the remainder in eight equal notes due six months apart, making the final payment due four years from the date of the order. The same company had previously supplied 105 units to Argentina.

FABRICATED STEEL

. . . Lettings decline to 9250 tons from 13,000 tons last week . . . New projects in small volume at 6550 tons . . . Plate awards call for 1640 tons.

NORTH ATLANTIC STATES

AWARDS

755 Tons, Elkton, Md., highway bridge, to Bethlehem Steel Co., Bethlehem, Pa.

360 Tons, Washington, Navy storehouses, to Lehigh Structural Steel Co., Allentown, Pa.

300 Tons, Pittsburgh, Leech Farm Sanitarium, to Pittsburgh Bridge & Iron Co., Pittsburgh.

360 Tons, Elizabeth, N. J., office and garage building, Public Service Electric & Gas Co., to Oltmer Iron Works, Jersey City.

260 Tons, Hornell, N. Y., channel improvement, to American Bridge Co., Pittsburgh.

255 Tons, Rochester, N. Y., State bridge No. 1, RC-4060, to American Bridge Co., Pittsburgh.

250 Tons, Monroe County, N. Y., state highway bridge RC-4060, to American Bridge Co., Pittsburgh.

200 Tons, Orange County, N. Y., state bridge RC 4033 FAGM RC 4032, to Harris Structural Steel Co., Plainfield, N. J.

200 Tons, N. Woodstock, N. H., state highway bridge, to Lackawanna Steel Construction Co., Buffalo; O. W. Miller Co., Ludlow, Mass., contractor.

175 Tons, Elizabethport, N. J., recreation building for Singer Mfg. Co., to Belmont Iron Works, Philadelphia.

150 Tons, Bowmansville, N. Y., state bridge No. RC-4050, to Bethlehem Steel Co., Bethlehem, Pa.

150 Tons, Dutchess County, N. Y., state bridge, FAS-SS-39-13, to Bethlehem Steel Co., Bethlehem, Pa.

130 Tons, Greene County, N. Y., state bridge, RC 4038 FAGN RC 4039, to Anthracite Bridge Co., Scranton, Pa.

140 Tons, Bloomsburg, Pa., factory and garage, Milco Undergarment Co., to Weatherly Steel Co., Weatherly, Pa.

SOUTH AND SOUTHWEST

675 Tons, Cross County, Ark., bridge, to Vincennes Bridge Co., Vincennes, Ind.

500 Tons, Pittsburgh County, Okla., bridge, to J. B. Klein Iron & Foundry Co., Oklahoma City.

470 Tons, Memphis, Tenn., transmission towers for TVA, to Bethlehem Steel Co., Bethlehem, Pa.

300 Tons, Mobile, Ala., post office and custom house, to Ingalls Iron Works Co., Birmingham.

135 Tons, Miller County, Ark., bridge, to J. B. Klein Iron & Foundry Co., Oklahoma City.

CENTRAL STATES

638 Tons, Milwaukee, apartment building, to Wisconsin Bridge & Iron Co., Milwaukee, erroneously reported last week to Milwaukee Bridge Co.

603 Tons, Peru, Ind., state bridge No. 1842, to Pan-American Bridge Co., New Castle, Ind.

375 Tons, Sturgis, S. D., state bridge FAP-242-B, to Bethlehem Steel Co., Bethlehem, Pa.

360 Tons, Stephen, Minn., and Grafton, N. D., Minnesota state bridge No. 5872, to Minneapolis-Moline Power Implement Co., Minneapolis.

350 Tons, Marble Cliff, Ohio, state bridge 4.15, to Bethlehem Steel Co., Bethlehem, Pa.

264 Tons, Linn Grove, Iowa, state bridge, to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

255 Tons, Gibson-Pike Counties, Ind., bridge, to American Bridge Co., Pittsburgh.

225 Tons, Chicago, State Street subway, contract S7, to American Bridge Co., Pittsburgh.

190 Tons, Cincinnati, theater and store building, Taft Estate, to Jones & Laughlin Steel Corp., Pittsburgh.

150 Tons, Yankton, S. D., state bridge FAP-77-A, to Bethlehem Steel Co., Bethlehem, Pa.

115 Tons, Valparaiso, Ind., state bridge No. 1841, to American Bridge Co., Pittsburgh.

105 Tons, Decorah, Iowa., bridge, to Clinton Bridge Co., Clinton, Iowa.

WESTERN STATES

460 Tons, Los Angeles, Northrup aviation plant, to Bethlehem Steel Co., Los Angeles.

PENDING STRUCTURAL PROJECTS

NORTH ATLANTIC STATES

1000 Tons, Washington, Potomac Electric Power Co. power house.

800 Tons, New York, apartment house, Louis Cowan.

150 Tons, Philadelphia, alteration to Stephano Brothers building; bids in.

115 Tons, Pittsburgh, Chartiers Avenue bridge.

THE SOUTH

600 Tons, Spring City, Tenn., TVA., suspension conveyor and walk bridges; Sherman & Reilly Co., Inc., contractor.

500 Tons, Canadian, Tex., bridge 458-A and miscellaneous bridge repairs, Atchison, Topeka & Santa Fe Railway.

250 Tons, Hiawassee Dam., Tenn., TVA. girder and beam spans for spillway bridge.

175 Tons, New Orleans, service building, Department of Agriculture.

CENTRAL STATES

900 Tons, Eau Claire, Wis., bridges 601 and 602, Eau Claire River; bids Sept. 12.

250 Tons, Chicago, yard structures related to synchronous condenser house, Commonwealth Edison Co., Crawford Avenue station; bids in.

115 Tons, Chicago, miscellaneous bridge repairs, Milwaukee Road; bids in.

105 Tons, Grant County, Wis., bridge No. 620; bids Sept. 12.

WESTERN STATES

600 Tons, Alameda, Cal., Navy power plant store house (revised tonnage); bids in.

500 Tons, Pearl Harbor, T. H., power plant, Robert E. McKee, Los Angeles, general contractor.

350 Tons, Coram, Cal., gate frames, etc., spec. 876, U. S. Bureau of Reclamation.

240 Tons, Denver, building for Government heating plant, Lowry Field.

185 Tons, Earp, Cal., tunnel supports for Parker Dam power plant (Specification 874); bids Sept. 22.

FABRICATED PLATES

AWARDS

1400 Tons, Charleston, S. C., tainter gates, Santee-Cooper dam, to Virginia Bridge Co., Roanoke, Va.

240 Tons, Bradford, Pa., eight oil tanks, to Hammond Iron Works, Warren, Pa.

PENDING PROJECTS

225 Tons, Memphis, Tenn., snag boat hull, U. S. Engineers Office.

SHEET PILING

AWARDS

1057 Tons, Los Angeles, river channel improvement, to Bethlehem Steel Co., Los Angeles; through Griffith Co., Los Angeles, contractor.

920 Tons, Toledo, municipal intake line, to Carnegie-Illinois Steel Corp., through American Construction Co.

397 Tons, Niland, Cal., All-American Canal (Invitation B-42293-B), to Inland Steel Co., Chicago.

PENDING PROJECTS

302 Tons, Canadian, Tex., Santa Fe railroad bridge No. 458 over Mobeetie Creek; bids Sept. 14.

Great Britain Establishes Control Over Iron and Steel Industry

LONDON, Sept. 5 (By Cable)—The British Minister of Supply has established control over the iron and steel industry. Licenses are needed to acquire iron and steel products including pig iron ingots, billets, blooms, slabs, sheet bars, tin plate, sections, bars, rods, rails and wire products; also iron ore containing not less than 15 per cent iron, manganese ore and ferroalloys except tungsten, vanadium, molybdenum and chrome alloys.

Certain exceptions in the license system are specified. Licenses are not required to deal in iron and steel scrap, but will be needed for the export of scrap and for export of certain goods made of iron and steel.

Maximum prices have been established on the basis of those already current in the industry. These are likely to remain unchanged at least until Oct. 31, next.

Sir Andrew Duncan has been appointed iron and steel controller.

Market conditions have been revolutionized as priority is given to Government orders, air raid defense, railways, shipbuilders and collieries.

The British steel industry is now engaged at full capacity. The shortage of semi-finished steel is causing concern, but it is hoped that larger quantities can be imported from the Dominions.

The Continental market has likewise been disorganized by the outbreak of war and the dislocation of transportation facilities.

Empire Buys Furnaces

CLEVELAND—Directors of Empire Sheet & Tin Plate Co., Mansfield, Ohio, have approved the expenditure of $53,000 for the purchase of two electric annealing furnaces from the Westinghouse Electric & Mg. Co., for immediate installation. Henry A. Roemer, chairman, and James M. Hill, President, were re elected.

. . . NON-FERROUS . . .

. . . War psychology grips non-ferrous consumers and markets soar on active demands . . . All metal prices higher, although advances so far have not been drastic . . . Tin market stalemated as supplies disappear and consumers offer 59c. a lb. or better.

NEW YORK — Consumption of copper continues to expand and all through the past week trading in the metal was moderately active but with no advance in quotations. Tuesday morning, however, found the market moving at a frantic pace and with several of the domestic producers unwilling to quote prices. Later in the afternoon, however, books were opened at 12.50c. a lb., delivered Connecticut Valley points, up 2c. a lb., from previous quotations. The red metal was available in considerable quantities at this level and consumers took advantage of the situation to enter quite heavy commitments. The war is not expected to interefere a great deal with foreign deliveries of metal, and producers most likely will place excellent tonnages in France, England and other countries abroad. In July, France was the largest single European buyer, taking 8787 tons, and England, Italy and Sweden also were large buyers, taking over 2000 tons apiece.

Tin

A terrific demand for spot tin started last week, and as war approached the demand became even more intensified. Today, practically no offer of tin came into the market, and consumers were willing to pay 59c. a lb. or even better, but were unable to obtain any metal. There has not been a very large reserve of tin built up in this country, and many consumers are today actually short of metal and other consumers are trying to build a protective future stock. What the forward position will be is impossible to forecast as deliveries of metal into this country will likely be subject to considerable delay. There has been no foreign open market in tin since the war started.

Lead

Anxiety of domestic consumers regarding the foreign situation resulted in steady buying all last week, and at the week's end almost all of September requirements were covered and positions in October were being taken. The market this morning, however, went mildly mad along with other non-ferrous markets, and consumers were entering orders for large blocks of metal regardless of a price advance of $3 a ton, up to 5.10c., St. Louis. As the market closed, the demands were as steady as earlier in the day, and the market trend displayed some indication of going higher.

Zinc

All last week the market demand for spelter continued at a fair pace, the price displaying a constant firm appearance. This morning, the bullish swing started, with all consumers coming in for moderate amounts of metal, the price in the meantime jumping to 5.75-6.00c. a lb. The forward position of most users is fairly well covered, although all sellers look for a continued strong demand and a buoyant price situation. Naturally, there is little or no buying interest in foreign metal as consumers have no certainty regarding the movement of zinc from the other side.

NON-FERROUS PRICES

Cents per lb. for early delivery

	Aug. 30	Aug. 31	Sept. 1	Sept. 2	Sept. 5
Copper, Electrolytic[1]	10.50	10.50	10.50	10.50	12.50
Copper, Lake	10.50	10.50	10.50	10.50	12.50
Tin, Straits, New York	48.75	49.75	52.00	....	59.00
Zinc, East St. Louis[2]	4.75	4.75	4.75	4.75	5.75
Lead, St. Louis[3]	4.90	4.90	4.90	4.90	5.10

[1] Delivered Conn. Valley. Deduct ¼c. for New York delivery. [2] Add 0.39c. for New York delivery. [3] Add 0.15c. for New York delivery.

Warehouse Prices

Cents per lb., Delivered

	New York	Cleveland
Tin, Straits pig	....	....
Copper, Lake	12.125c.	12.00c.†
Copper, electro	12.00c.	12.00c.†
Copper, Castings	11.50c.	11.75c.†
*Copper sheets, hot-rolled	18.62c.	18.62c.
*High brass sheets	16.85c.	16.85c.
*Seamless brass tubes	19.60c.	19.60c.
*Seamless copper tubes	19.12c.	19.12c.
*Brass rods	12.19c.	12.19c.
Zinc slabs	6.15c.	6.90c.
Zinc sheets, No. 9 casks	10.75c.	12.10c.
Lead, American pig	6.05c.	5.95c.
Lead, bar	8.50c.	8.25c.
Lead, sheets, cut	8.00c.	8.00c.
Antimony, Asiatic	15.00c.	17.00c.
Alum., virgin, 99 per cent plus	21.50c.	22.50c.
Alum., No. 1 remelt., 98 to 99 per cent	19.00c.	19.50c.
Solder, ½ and ½	29.20c.	29.50c.
Babbitt metal, commercial grade	21.20c.	21.50c.

†Copper prices are nominal.

*These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	8.375c.	9.00c.
Copper, hvy. and wire	7.375c.	7.75c.
Copper, light and bottoms	6.50c.	6.975c.
Brass, heavy	4.50c.	5.00c.
Brass, light	3.625c.	4.375c.
Hvy. machine composition	6.50c.	7.375c.
No. 1 yel. brass turnings	4.25c.	4.75c.
No. 1 red brass or compos. turnings	6.375c.	6.875c.
Lead, heavy	4.125c.	4.50c.
Cast aluminum	6.50c.	7.75c.
Sheet aluminum	12.50c.	14.00c.
Zinc	2.25c.	3.50c.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered: virgin, 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York: Asiatic, 14c. a lb., f.o.b.; American, 12c. a lb. QUICKSILVER, $82.50 to $84.50 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 10.75c. a lb.

Meehanite Metal Corp. has granted Meehanite manufacturing licenses to the Vancouver Engineering Works, Ltd., Vancouver, B. C., and to the Washington Machinery & Supply Co., Spokane, Wash. The Meehanite Research Institute of America, Inc., the cooperative research organization composed of Meehanite manufacturers in the United States and Canada, will hold its next annual meeting at the Hotel Statler, Detroit, Nov. 1, 2 and 3.

Recent Offerings in Motors, Controllers and Lighting Equipment

(CONTINUED FROM PAGE 55)

break, non-shorting, single pole rotary selectors particularly designed for a.c. use. Contacts and mechanism are entirely enclosed in a ceramic body. The silver contacts are self-cleaning and the cam and roller mechanism provides a slow break, quick make action, minimizing arcing. The shafts are electrically dead. Some possible applications are for arc and spot welder control, voltage regulators and machine tool controls.

These power tap switches may be had singly or in tandem assemblies of two, three, four or more units. In tandem form they can be used to switch both sides of a single-phase line or all phases of a three-phase line, or to provide simultaneous control of separate circuits.

Industrial Lighting Units

SUPPLEMENTAL lighting at an oblique angle for fine assembly work, exact machine work and inspection is provided by the new industrial concentrator lighting units announced by *Westinghouse*. The complete unit consists of aluminum reflector, porcelain socket assembly, cast-aluminum socket housing and aluminum swivel-mounting bracket for ½-in. conduit mounting. It employs a one-piece reflector with diffuse or specular reflecting surface treated by the Alzak process.

Heat-resisting glass lenses, either plain or heavy stippled, are held to reflector by a split lens holding ring with self-spreading lug to facilitate lens removal. A rubber gasket between the reflector and lens gives a vapor proof and dust-tight seal. This luminaire is furnished in two sizes. The smaller uses 200-watt clear or inside frosted bulb, and the larger unit uses 300 or 500-watt clear lamps.

EQUIPMENT for disconnecting and lowering high positioned lighting fixtures for cleaning or relamping has been in use for years, but up until now the application to floodlighting units has been very limited because of lack of means of pointing the light beam in its original direction after disconnecting and lowering. A unit to accomplish this has recently been devised by the *Thompson Electric Co.*, Cleveland. Sold as a packaged unit, it assures that the floodlight will always position itself exactly when returned after lowering. The assembly consists of the hanger, U-bolts for mounting to the bracket, a bracket end and slip fit elbow to inclose the electrical conductors, a fully inclosed corner pulley with a flare end, 25 ft. of galvanized chain and galvanized lock box, and a spring to keep the chain taut.

Fluorescent Lighting Units

ANOTHER *Westinghouse* development is a concentrating type, single and two-lamp fluorescent luminaire for general or supplementary industrial lighting applications where an efficient, low brightness, extended source is required. A steel housing completely encloses reflectors, sockets and controls. The reflectors, finished by the Alzak process, are drawn from 18-gage aluminum sheet. The reflecting surface has a specular finish for the concentrating type two-lamp unit and a diffuse finish for the spread type single-lamp units. Housings are finished inside with baked white synthetic enamel. All housings, except on the 24-in. units, are provided with two-point suspension for attaching to ½ or ¾-in. conduit. Hoops for chain suspension, safe-change hangers, or adjustable swivels for ½-in. conduit are available as accessories.

A COMPLETE fluorescent lighting unit for industrial and commercial users has been announced by the *Hygrade Sylvania Corp.*, Salem, Mass. This unit, called the Hygrade HF-100, is sold complete with two standard Hygrade 40-watt, 48-in. fluorescent lamps, ready to hang up and plug in any standard 60 cycle a.c. socket. Two different types of units are available, one for operation on 115 volts, the other on 230 volts. These units are corrected for power factor, and stroboscopic effect is practically eliminated. They provide several times the light, with only one-quarter the radiant heat and one-half the total heat of incandescent light sources.

High Bay Reflector

THE Locklite principle of attaching industrial reflectors has been applied to a new *Westinghouse* high bay aluminum reflector designed for use with incandescent lamps for general lighting of high bay areas in foundries, steel mills, machine shops, etc. This feature speeds installation, reduces maintenance and provides interchangeability. Each Locklite unit consists of two parts: a hood and a receptacle into which the reflector with lampholder fits. When the reflector is turned 60 deg., lugs on the neck of the reflector lock into the slots of the hood and the electrical connection is made.

More Machine Tool Congress Programs Listed

CLEVELAND — The Cleveland Engineering Society announces the following program for its Oct. 10 meeting to be held in Cleveland as a part of the Machine Tool Congress coincident with the Machine Tool Show.

Tuesday, Oct. 10, Music Hall, Public Auditorium, 8.00 p.m. Chairman will be Charles J. Stilwell, president, The Warner & Swasey Co., Cleveland. S. Paul Johnston, Editor, "Aviation," New York, will speak on "Progress in Aircraft Building."

The National Electrical Manufacturers Association announces the following program for its Oct. 4 meeting, to be held in Cleveland as a part of the Machine Tool Congress.

Wednesday, Oct. 4, Music Hall, Public Auditorium, 8.00 p.m. The meeting will be presided over by B. D. Christian, vice-president, Crocker-Wheeler Electric Mfg. Co., and chairman of the Industrial Electrification Committee, National Electrical Manufacturers Association.

"Electricity, Machine Tools and Production," will be discussed by W. J. Donald, managing director, National Electrical Manufacturers Association. "Industrial Progress," will be the subject of address by Gen. Hugh S. Johnson, commentator, Scripps-Howard Newspapers. General Johnson's address will be followed by a forty-five minute question and answer forum.

REINFORCING STEEL

. . . Awards of 9610 tons; 4225 tons in new projects.

ATLANTIC STATES
AWARDS

350 **Tons,** Brooklyn, sewer, to Igoe Bros., Newark, N. J.; Delhan Construction Co., contractor.

125 **Tons,** Monroe County, Pa., route R-168, to Bethlehem Steel Co., Bethlehem, Pa.; Primo Marinelli, contractor.

100 **Tons,** Cumberland County, Pa., bars for road construction, to Bethlehem Steel Co., Bethlehem, Pa.

CENTRAL STATES

1500 **Tons,** Fort Wayne, Ind., sewage treatment plant, to Truscon Steel Co., Youngstown, through Wermouth Construction Co., contractor.

500 **Tons,** Rock Island, Ill., sewage treatment plant, to Laclede Steel Co., St. Louis; Stark Construction Co., contractor.

500 **Tons,** Chicago, Chatham Park housing project, to Calumet Steel Co., Chicago.

250 **Tons,** Indianapolis, waterworks, to Truscon Steel Co., Youngstown.

120 **Tons,** Sandusky, Ohio, joists for store building, to Truscon Steel Co., Youngstown, Ohio.

100 **Tons,** Evanston, Ill., Scott Hall, to Ceco Steel Products Co., Chicago.

WESTERN STATES

3010 **Tons,** Parker, Ariz., United States Indian Service (Invitation 538), to Pacific States Steel Corp., San Francisco.

2684 **Tons,** Los Angeles, river channel improvement, to Bethlehem Steel Co., Los Angeles; through Griffith Co., Los Angeles, contractor.

255 **Tons,** Pearl Harbor, T. H., barracks (Specification 9156), to Honolulu Iron Works, Honolulu; through W. S. Ching, Honolulu, contractor.

115 **Tons,** Antioch, Cal., Fiber Board Products Co. plant addition, to Gilmore Steel & Supply Co., San Francisco; through K. E. Parker, San Francisco, contractor.

PENDING REINFORCING BAR PROJECTS
ATLANTIC STATES

1100 **Tons,** Bladensburg, Va., Anacostia sewage plant, contract No. 9; Virginia Engineering Co., Newport News, low bidder.

800 **Tons,** Boston, Roxbury district, housing project.

275 **Tons,** New York, Rapid Transit Railroad, route 110, section 6B; Johnson Corp. and Necaro Co. low bidder.

CENTRAL STATES

700 **Tons,** Menasha, Wis., Marathon Paper Co.

200 **Tons,** Knox County, Ill., White River bridge No. 8146.

WESTERN STATES

915 **Tons,** Fort Peck, Mont., United States engineer (Invitation 631-40-56); bids in.

117 **Tons,** Alameda, Cal., improvement at Naval air station (Specification 8614) bids in.

115 **Tons,** Hopland, Cal., bridge; bids in.

CAST IRON PIPE

Hartford, Conn., has awarded 330 tons of 42-in. and 48-in. pipe and 61 tons of fittings to Warren Foundry & Pipe Corp.

Providence, R. I., has awarded 175 tons of 6-in. pipe to Warren Foundry & Pipe Corp., deliveries to start latter part of this month.

Coleman County Fresh Water Supply District No. 1, Gouldbush, Tex., plans about 9000 ft. of 3-in., and 10,000 ft. of 2 and 1-in. pipe for water system; also will build water reservoir, filtration plant and other waterworks structures. Clarence Cooper, Coleman, Tex., is consulting engineer.

Lakewood, Ohio, plans pipe lines for water system extensions and replacements; also other waterworks installation. Cost over $1,000,000. Chester Engineers, Inc., Century Building, Pittsburgh, is consulting engineer.

Oakland, Iowa, plans about 5000 ft. of various sized pipe for water system; also other waterworks installation. Proposed to begin work early in October.

Warrenton, Mo., plans pipe lines for water system and other waterworks installation. Fund of about $75,000 is being arranged for this and sewerage system. Edward A. Fulton, 3 South Mermec Street, St. Louis, is consulting engineer.

General Purchasing Officer, Panama Canal, Washington, asks bids until Sept. 12 for quantity of cast iron water pipe (Schedule 3579).

Washington County Board of Supervisors, Bristol, Va., plans main pipe line, about 12 miles long, to Abingdon-Bristol district, for water supply in that area. H. H. Williams, Hotel Bristol, Bristol, is consulting engineer.

Grundy, Va., plans pipe lines for water system; also other waterworks installation. Cost about $50,000. J. B. McCrary & Co., Atlanta, Ga., are consulting engineers.

Greybull, Wyo., plans main pipe line from Canton, Wyo., to city limits for water supply; also will make extensions in system, with installation of other waterworks equipment. Cost about $235,000. Special election has been called Sept. 12 to approve bonds in that amount.

Metropolitan Utilities District, Eighteenth and Harney Streets, Omaha, Neb., plans pipe lines for water system in district No. 1588, recently created.

Wilkesboro, N. C., plans main pipe line, about four miles long, for gravity water supply. Financing is being arranged. J. B. McCrary & Co., Atlanta, Ga., are consulting engineers.

Amherst, Ohio, plans pipe lines for water system and other waterworks installation. A bond issue of $60,000 for project will be voted on at general election, Nov. 7.

. . . PIPE LINES . . .

Consumers Power Co., Jackson, Mich., plans extensions and replacements in pipe line systems in different parts of company territory, for natural and artificial gas transmission, including new distribution lines in several city areas. Company has authorized immediate remodeling of coal-gas plant at Kalamazoo, Mich., for conversion for production of oil-gas. Complete project will form part of general expansion and improvement program in electric and gas properties, recently approved, and for which a total appropriation of $9,000,000 has been arranged.

Peoples Natural Gas Co., City National Bank Building, Omaha, Neb., plans extensions in welded steel pipe lines to Milford and Spirit Lake, Iowa, for natural gas transmission. Project will include control and regulator stations, distribution lines and other operating facilities.

Commanding Officer, Ordnance Department, Rock Island Arsenal, Rock Island, Ill., asks bids until Sept. 11 for 1352 ft. of welded steel pipe; also for 1700 ft. of wrought iron pipe (Circular 137).

Pascagoula, Miss., has called special election Sept. 25 to approve bond issue of $360,000 for acquiring local gas distribution system and establishing a municipal natural gas system. Extensions and improvements will be made in existing lines and facilities.

Northern Natural Gas Co., Aquila Court Building, Omaha, Neb., has let contracts to C. L. Foreman Co. and Truman-Smith Construction Co., both Tulsa, Okla., for new 16-in. welded steel pipe line from point near Sioux City, Iowa, to Minneapolis, Minn., close to 250 miles, for natural gas transmission. First noted contractor will build western section of line and Truman-Smith company, eastern section. Award for steel pipe, totaling about 30,000 tons, has been divided among National Tube Co., Youngstown Sheet & Tube Co. and Republic Steel Corp. Entire project will cost about $6,000,000, including lateral lines, compressor stations and other operating facilities. Financing in that amount has been arranged.

Tydal Refining Co., Gainesville, Tex., recently organized to take over and operate a local refining plant, is considering new welded steel pipe line from oil field area to refinery for crude oil transmission. J. Curtis Stanford, Tyler, Tex., is president.

Cheney, Kan., plans pipe line system for gas distribution. A bond issue of $27,000 is being arranged for project.

Bureau of Reclamation, Denver, has awarded contract to John W. Beam, Denver, at $14,450 for two 96-in. outside diameter, welded plate-steel outlet pipes, f.o.b. Chicago, for installation in outlet works, Wickiup dam, Deschutes project, Ore. (Specifications 1250-D).

Grand River Dam Authority, City Hall, Vinita, Okla., asks bids until Sept. 12 for 22,000 ft. of double 10-in. steel pipe line for hydroelectric power project; also for removal of two 10-in. pipe lines, each about 20,200 ft. long (Contract No. 16). Holway & Neuffer, 302 East Eighteenth Street, Tulsa, Okla., are consulting engineers. Estimated cost of pipe line work, $172,335.

August Iron Output Up to 2,695,813 Tons

PRODUCTION of coke pig iron in August totaled 2,695,813 gross tons, compared with 2,356,270 tons in July. On a daily basis August showed a gain of 12.9 per cent over that in July, from 76,009 tons to 85,800 tons a day in August, which was the highest since October, 1937, when daily production averaged 93,311 tons a day. The rate of operation last month was at 62.9 per cent of the industry's capacity, as compared with 55.8 per cent in July.

There were 138 furnaces making iron on Sept. 1, operating at the rate of 87,715 tons a day, compared with 130 (revised) furnaces on Aug. 1, producing at the rate of 79,765 tons daily. Ten furnaces were put in operation and two were blown out. The United States Steel Corp. put five in operation. Independent producers put four in operation and took two off blast and merchant producers blew in one furnace.

Furnaces blown in included: one Duquesne, one Edgar Thomson, one Ohio, one South Chicago, and one Gary, Carnegie-Illinois Steel Corp.; two Eliza, Jones & Laughlin Steel Corp.; one Cambria, Bethlehem Steel Co.; one Anna, Struthers Iron & Steel Co.; and one Zug, National Steel Corp.

Furnaces blown out were the Trumbull-Cliffs and one Pioneer furnace of Republic Steel Corp.

Imports at Philadelphia

PHILADELPHIA—The following iron and steel imports were received here during the past week: 5 tons of pig iron from Brazil; 138 tons of sponge iron, 32 tons of steel tubes, 23 tons of steel bars and 40 tons of structural shapes from Sweden.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

American Brake Shoe & Foundry Co., 230 Park Avenue, New York, plans one-story addition to branch plant at Birmingham, operated as Southern Wheel Division of company. Cost close to $100,000 with equipment.

G. F. Harvey Co., Wells Street, Saratoga Springs, N. Y., drugs and chemicals, has let general contract to William J. Murray Construction Co., 41 South Pearl Street, Albany, N. Y., for two-story and basement addition. Cost close to $50,000 with equipment.

Public Works Officer, Navy Yard, Brooklyn, asks bids (no closing date stated) for one 115-ft. steel radio mast (Specifications 9198).

Carlton Cooke Plating Corp., 67 Frankfort Street, New York, manufacturer of plated metal goods, has leased floor in building at 132 Lafayette Street, about 10,000 sq. ft. of floor space for plant, expanding present capacity.

Commanding Officer, Ordnance Department, Watervliet Arsenal, Watervliet, N. Y., asks bids until Sept. 12 for quantity of gages (Circular 80), phosphor bronze tubing (Circular 94), trigger shafts (Circular 81); until Sept. 15, alloy steel forgings (Circular 89); until Sept. 19, six knee-type milling machines (Circular 78).

Mathieson Alkali Works, Inc., 60 East Forty-second Street, New York, has construction under way on new plant at Lake Charles, La., for production of synthetic salt cake (sodium sulphate), operated as a division of present caustic soda and soda ash-manufacturing works at that place. Cost over $500,000 with machinery.

National Sugar Refining Co., 129 Front Street, New York, plans one-story addition to refinery at Front and Pidgeon Streets, Long Island City, for storage and distribution. Cost over $150,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 12 for four transformer-type portable welders, a.c. (Schedule 7061) for Brooklyn and Philadelphia Navy yards; one motor-driven milling machine (Schedule 7057); until Sept. 15, one gas-fired, car bottom-type furnace (Schedule 7083), double-housing, motor-driven hydraulic planer (Schedule 7082), engine-driven fuel pumps, in lots of 53 to 354, and 45 to 195 respectively (Schedule 7071) for Philadelphia yard.

Reynolds Metals Co., Inc., 539 West Twenty-fifth Street, New York, metal foils and allied products, has leased about 20,000 sq. ft. of floor space in building at 310 Twelfth Street, Jersey City, N. J., for new branch storage and distributing plant.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until Sept. 18 for 32,000 ft. of cable and 31 reels (Circular 56).

Pyrene Mfg. Co., 560 Belmont Avenue, Newark, N. J., manufacturer of fire extinguishers, has let general contract to Wigton-Abbott Corp., 60 East Forty-second Street, New York, for two-story addition, 130 x 190 ft. Cost close to $90,000 with equipment.

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until Sept. 11 for nine sets of high-speed steel geometric chasers and 18 high-speed steel hobs (Circular 252), 31,500 closing plugs (Circular 264), reworking 6100 lb. of aluminum turnings (Circular 163); until Sept. 12, 40,300 body caps and 40,300 body closing plugs (both steel bar), 40,300 primer holders (brass rod), and 40,300 firing pin holder plugs (steel bar) (Circular 271); until Sept. 13, three selective-speed, geared-head turret lathes, 1¾-in. capacity (Circular 190), 100,000 primers (Circular 187); until Sept. 15, lock nuts and couplings for demolition bombs and tubes for bombs (steel bar stock and steel tubing, both machined) (Circular 193).

Public Service Electric & Gas Co., Public Service Terminal, Newark, N. J., has let general contract to Damon G. Douglas Co., 605 Broad Street, for two-story and basement building for electrical distribution division on West Grand Avenue, Elizabeth, N. J., with equipment storage and distribution facilities, service and garage unit for company motor trucks and other operating departments. Cost close to $250,000 with equipment.

Sterilized Soda Water Co., 415 So. Wyoming Avenue, Scranton, Pa., plans one-story mechanical-bottling plant on Scranton-Pocono Highway, near city. Cost close to $45,000 with equipment.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until Sept. 12 for two hydraulic internal grinders and two universal cylindrical hydraulic grinders, all motor-driven (Circular 198), one hardening and tempering electric unit, positive non-oxidizing, with permanent records, automatic and non-packing type (Circular 203); until Sept. 13, seamless brass tubing (Circular 225); until Sept. 15, one or two horizontal cutting and swaging machines, caliber 0.30 (Circular 153).

BUFFALO DISTRICT

Rome Cable Corp., Ridge Street, Rome, N. Y., electrical cable and wire, plans one-story addition for storage and distribution. Cost close to $50,000 with equipment.

Purchasing and Contracting Officer, Quartermaster Corps, Fort Ontario, N. Y., asks bids until Sept. 12 for one ball-bearing bench saw and ball-bearing jointer, both motor-driven (Circular 646-4).

American Brake Shoe & Foundry Co., 1673 Bailey Avenue, Buffalo, plans extensive mechanization of local plant in conjunction with one-story addition, recently noted, including automatic conveyor and air-conditioning systems in molding and shake-out divisions, and other mechanical-handling facilities. Cost about $70,000.

WASHINGTON DIST.

Purchasing Officer, Bonneville Project, Department of Interior, Washington, asks bids until Sept. 13 for one gasoline engine-driven generator set (Circular 523).

John C. Stalfort & Sons, Inc., 814 East Lombard Street, Baltimore, chemical products, plan rebuilding part of four-story plant recently destroyed by fire. Loss about $75,000 with equipment.

General Purchasing Officer, Panama Canal, Washington, asks bids until Sept. 11 for two 30-ton diesel engine-driven locomotive cranes, 5-ft. gage, with 50-ft. boom (Schedule 3575); until Sept. 12, 15,000 ft. of galvanized steel wire poultry netting, 11,000 ft. of galvanized steel wire cloth, 12,000 ft. of 30-in. copper wire cloth, two steam pumps, galvanized turnbuckles, 12 galvanized kedge anchors, etc. (Schedule 3571), two deep-well pumping units (Schedule 3572), gate valves, check valves, steel machine bolts, fire hydrants, etc. (Schedule 3579).

Eastern Shore Public Service Co., Salisbury, Md., plans new steam-electric generating plant at Vienna, Md., for Delmarva Power Co., Vienna, a subsidiary. Cost close to $1,000,000, including transmission lines for connection with present system. Financing is being arranged through bond issue.

United States Engineer Office, Navy Building, Washington, asks bids until Sept. 12 for 1-in. special dragline cable, with steel wire rope center (Circular 37).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 12 for four electric-hydraulic type windlasses and spare parts (Schedule 7013) for Boston and Charleston Navy yards; horizontal centrifugal pumps, with controlling appliances and spare parts (Schedule 7018) for Boston, Charleston and Puget Sound yards; one engine lathe (Schedule 7043), one vertical lathe (Schedule 7037) for Charleston yard; 655 phosphor bronze seamless drawn blank shells (Schedule 7063), 550 steel blank after-body shells (Schedule 7055) for Newport, R. I., naval air station; one bolt-threading machine (Schedule 7056) for Philadelphia yard; one or two boring, milling and drilling machines (Schedule 7060) for Washington; one automatic tapping machine (Schedule 7059) for Alexandria, Va., yard, all machines to be motor-driven.

SOUTH ATLANTIC

Florida Power & Light Co., Miami, Fla., plans addition to steam-electric generating station at Dania, Fla., 50 x 100 ft., and 88 ft. high, with installation of new 25,000-kw. steam turbo-generator and auxiliary equipment, high-pressure boilers to use oil as fuel, and accessories. Extensions in transmission and distributing lines also will be made. Entire project will cost about $3,000,000.

United States Engineer Office, Wilmington, N. C., asks bids until Sept. 11 for 6000 ft. of plow steel wire rope (Circular 26).

Cordele Winery Co., Cordele, Ga., plans expansion in distillery, including new operating units and equipment to double present capacity. Cost over $75,000 with machinery.

SOUTH CENTRAL

Mobile Steel Co., Mobile, Ala., has approved plans for expansion and improvements, including new overhead electric traveling crane and other mechanical-handling facilities.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Sept. 19 for aluminum housing for 13.8-kv. metal-clad switchgear at Hiwassee hydroelectric power plant, miscellaneous hardware, etc.

Southern Cement Co., Chamber of Commerce Building, Birmingham, has engaged Burrell Engineering & Construction Co., 400 West Madison Street, Chicago, engineer, to prepare plans for one-story storage and distributing building at North Birmingham mill to replace a structure recently destroyed by fire. Cost close to $100,000 with equipment.

WESTERN PA. DIST.

McKenna Brass & Mfg. Co., Susquehanna Street, Millersburg, Pa., brass and copper products, is negotiating for purchase of plant and business of Joseph Reid Gas Engine Co., Oil City, Pa., operating under receivership. A consideration stated at $382,000 will be given for property, which will be improved and continued in operation by purchasing company.

Aluminum Co. of America, Inc., Gulf Building, Pittsburgh, plans addition to plant at New Kensington, Pa. Cost over $75,000 with equipment. Company also will build one-story addition to branch plant on Harvard Boulevard, Cleveland. Cost close to like amount.

NEW ENGLAND

Public Works Officer, Naval Station, Portsmouth, N. H., asks bids until Sept. 15 for one 1500-kw. rotary converter and one 1650-kva. transformer (Specifications 9373).

Special Products Co., 750 Main Street, Hartford, Conn., metal goods, has leased one and two-story building, 240 x 560 ft., to be erected by Union Estates, Inc., 375 Fairfield Avenue, Stamford, Conn., on Barney Place, Stamford. First floor will be equipped for machine shop and other production divisions. Cost close to $100,000 with equipment. General erection contract has been let to Chanin Construction Co., 122 East Forty-second Street, New York, which also prepared plans.

Commanding Officer, Ordnance Department,

Springfield Armory, Springfield, Mass., asks bids until Sept. 12 for one multi-cut copying lathe, rotating cutters (Circular 41), one coining die, shaving and trimming die, piercing die and one bending die (Circular 43); until Sept. 13, six vertical surface, alternating double-ram broaching machines (Circular 39), 3-oz. oilers and sub-machine gun cleaning rods (Circular 47), high-speed light-type drilling machine, three two-spindle vertical drill presses (Circular 37); until Sept. 14, precision-type bench lathe (Circular 42); until Sept. 15, 10 10-in. cylindrical plain grinders, 40 drive dogs, 14 mounting adapters, three wheel-forming devices for 5-in. wheels and two hand-operated center pointers (Circular 34).

OHIO AND INDIANA

Bud Radio, Inc., 5205 Cedar Avenue, Cleveland, has asked bids on general contract for three-story addition, 35 x 200 ft. Cost close to $75,000 with equipment. Leonard L. Broida, 1643 Lee Road, is architect.

Aetna Paper Co., 135 Columbia Street, Dayton, Ohio, writing paper stocks, has let general contract to I. F. Weber & Co., Commercial Building, for two-story addition, 70 x 100 ft. Cost over $60,000 with equipment.

Sun Oil Co., Columbus, Ohio, plans new bulk storage and distributing plant for gasoline and other oils on Wilson Road, near city limits, including steel tank storage division, pumping station and other structures. Cost over $80,000 with equipment. Main offices of company are at Philadelphia.

Reliable Barrel Co., 1443 East Fortieth Street, Cleveland, steel barrels, drums, etc., has leased property for new plant at Grant Avenue and East Forty-ninth Street, consisting of about 1½ acres, improved with one-story building. Present works at address first noted will be removed to new location and capacity increased. Company will continue operation of other local plant at 2370 East Sixty-seventh Street, as heretofore.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Sept. 11 for tinners' formers, groovers and tinners' machines, three punch and shear combinations, 80 roof seamers, 80 rivet sets and headers, tinners' bench standards, etc. (Circular 167), cast iron lapping and cast iron surface plates, one motor-driven, pressure-type portable cleaner (Circular 174); until Sept. 12 for 65 1-ton, 79 2-ton, 21 3-ton, and 38 5-ton spur gear chain hoists (Circular 177), 26 hand tachometers, 300 to 12,000 r.p.m. (Circular 178), 203 spray-type engine cleaners (Circular 175); until Sept. 14 for shaft assembly turn indicators, 10 ft. 5 in. long, and 20 and 100 similar indicators, 16½ ft. and 20½ ft. long respectively (Circular 182); until Sept. 15, landing gear cord assemblies (Circular 186).

City Council, Richmond, Ind., plans expansion and improvements in municipal power plant, including new turbine-generator unit and auxiliary equipment, high-pressure boilers and accessories, and miscellaneous equipment; also additions and improvements in power substations, including equipment. Entire project will cost about $900,000.

MICHIGAN DISTRICT

Michigan Sugar Co., Saginaw, Mich., has let general contract to Francis Corr & Son, Lansing, Mich., for one-story addition to beet sugar mill at Lansing, for pulp storage and distribution. Cost over $50,000 with equipment. Giffels & Vallet, Inc., & L. Rossetti, Marquette Building, Detroit, is architect and engineer.

Construction Service, Veterans' Administration, Washington, asks bids until Sept. 26 for ash conveyor system for power house at institution at Camp Custer, Mich.

Mueller Brass Co., Port Huron, Mich., brass, copper and other metal products, plans two one-story additions, for expansion in tube mill department and for storage and distribution respectively. Cost over $100,000 with equipment.

Love Tractor Co., Benton Harbor, Mich., motor tractors and parts, has acquired a one-story building at Eau Claire, Mich., formerly used by Godfrey Canning Co., and will modernize for new plant. Part of works will be used for production of roller conveyor equipment.

SOUTHWEST

Missouri-Pacific Railway Co., Missouri-Pacific Building, St. Louis, will make extensions and improvements in power house at yards at Kansas City, Mo., including installation of additional equipment. Cost about $50,000. Lonsdale Brothers, Telephone Building, Kansas City, are contractors.

Coca-Cola Co., Little Rock, Ark., has let general contract to M. O. Branton, 501 Cedar Street, for extensions and improvements in mechanical-bottling plant at Brinkley, Ark., including additional equipment. Cost about $45,000 with machinery.

Reed Roller Bit Co., Mack Street, Houston, Tex., manufacturer of oil well drilling machinery and allied equipment, has let general contract to Sam D. Cook, 6418 Esperson Street, for one-story addition, 90 x 250 ft. Cost over $60,000 with equipment.

Wolfe City Oil Mill Co., Wolfe City, Tex., cottonseed oil products, plans expansion and improvements, including machinery modernization. Cost about $50,000 with equipment. Company was acquired recently by new interests, headed by W. T. P. Stoddard, Bonham, Tex., and associates.

Central Power & Light Co., San Antonio, Tex., has engaged Sargent & Lundy, Inc., 140 South Dearborn Street, Chicago, consulting engineer, to prepare plans for new steam-electric generating plant at Corpus Christi, Tex., to be operated in conjunction with present power station at that place. Extensions will be made in transmission lines. Cost over $500,000.

MIDDLE WEST

Deep Rock Oil Co., 155 North Clark Street, Chicago, has asked bids on general contract for one-story bulk storage and distributing building, 75 x 150 ft., at 1322 Kingsbury Street. Cost close to $50,000 with tanks and other equipment.

Commanding Officer, Ordnance Department, Rock Island Arsenal, Rock Island, Ill., asks bids until Sept. 11 for 163,000 steel safety nuts, 126,000 safety nuts and 12,000 elastic stop nuts (Circular 128), engine parts, including brake shoe linings, brake shoe anchor pin nut locks, brake shoe anchor pin locks, bevel gear drives, brake spring pins, steering knuckle retainers, etc. (Circular 129), engine parts, including brake shoe links, brake assembly shoes, brake cams, brake shoe springs, etc. (Circular 136), 125 primer pumps, 6000 oiler bodies and 3000 oil buffer filling-oilers (Circular 142), quantity of copper tubing (Circular 145).

George Gorton Machine Co., Thirteenth Street, Racine, Wis., milling machines and other machine tools and parts, has asked bids on general contract for one-story addition, 60 x 200 ft., with crane bay running entire length of structure. Cost over $75,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Omar Milling Co., W.O.W. Building, Omaha, Neb., has let general contract to Parsons Construction Co., 701 North Twentieth Street, for five-story and basement addition to grain mill. Cost over $60,000 with mechanical-handling and other equipment. John and Allan McDonald, Standard Oil Building, are architects.

Construction Service, Veterans' Administration, Washington, asks bids until Sept. 26 for ash conveyor system for power house at institution at Danville, Ill.

John Deere & Co., Moline, Ill., farm and agricultural machinery and parts, have let general contract to A. Sugarman Co., 919 North Michigan Avenue, Chicago, for three-story and basement addition, 100 x 180 ft., to plant at East Moline, to be known as Factory Building M. Cost over $100,000 with equipment.

Ahdawagam Paper Products Co., Wisconsin Rapids, Wis., has asked bids on general contract for one-story addition, 240 x 280 ft. Cost over $130,000 with equipment. Thomas Utegaard is company engineer.

PACIFIC COAST

Fibreboard Products, Inc., Russ Building, San Francisco, corrugated board products, has let general contract to K. E. Parker Co., 135 South Park Street, for one-story addition to mill at Antioch, Cal., 80 x 375 ft., for storage and distribution. Cost close to $100,000 with equipment. Leland S. Rosener, 233 Sansome Street, San Francisco, is consulting engineer.

Constructing Quartermaster, San Francisco and vicinity, Fort Mason, Cal., asks bids until Sept. 14 for 17,000 ft. of metallic armored cable (Circular 6616-8).

Essick Machinery Co., 1928 Santa Fe Avenue, Los Angeles, machinery and parts, has asked bids on general contract for one-story addition, 95 x 163 ft., at Fourteenth Street and Santa Fe Avenue. Cost over $45,000 with equipment. W. J. Saunders, 785 East Pico Street, is architect.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Sept. 27 for one-story engine test building at naval air station, Alameda, Cal. (Specifications 9200), for two steel hangars, each 240 x 470 ft., same location (Specifications 8621).

Superintendent of Public Service, Glendale, Cal., asks bids until Sept. 14 for two steam-generating units and auxiliary equipment for municipal power plant, each unit to have capacity for generating 200,000 lb. of steam per hour and provided with superheater, air heater, fuel oil burners and accessories.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 15 for eight floor-type drills, with motor, controller and spare parts (Schedule 7041).

Quartermaster, Fort Lewis, Wash., asks bids until Sept. 12 for one portable belt-type conveyor loader, for coal or aggregate, with electric motor (Circular 488-6).

Bureau of Reclamation, Denver, asks bids until Sept. 20 for five gate frames for coaster gates at inlets of main-unit penstocks at Shasta dam, Kennett division, Central Valley project, Cal. (Specifications 876).

FOREIGN

Public Works Tenders Board, Wellington, New Zealand, asks bids until Sept. 26 for one 30-ton overhead electric traveling crane; until Oct. 3, water-heating controlling equipment.

Noranda Mines, Ltd., Royal Bank Building, Toronto, Ont., will take bids soon for new milling plant at gold and silver mining properties at Noranda, Que. Cost close to $200,000 with equipment.

Manitoba Sugar Co., Ltd., Royal Bank Building, Winnipeg, Man., plans new beet sugar mill near Fort Garry, Man., comprising one and multi-story units for main refinery, packing, storage and distribution; power house, machine shop, pumping station and other mechanical departments. Cost over $1,500,000 with machinery.

New Steel Plant in Ireland Is Opened

LONDON—A further important stage in Eire's industrial revival was accomplished on Aug. 2, when Sean F. Lemass, minister for commerce and industry, opened the new steel mills at Haulbowline, Cork Harbor, the former British naval dockyard. These £500,000 mills are now ready to begin immediate production and will supply Eire's entire steel requirements.

THIS WEEK'S MACHINE . . . TOOL ACTIVITIES . . .

. . . August sales held up well in most centers . . . Many feel that war in Europe will have little effect upon domestic business . . . Delivery of foreign orders the chief uncertainty at present.

Domestic Market Not Yet Affected by European War

CINCINNATI—As Europe approached the climax last week, no effect could be noted upon the local machinery market. Demand continued at about the level that has prevailed during the past two weeks, with some indication of moderate improvement in domestic ordering. One or two lines of tools are slightly slower in the foreign interest, but the amount of decline has not been sufficient to affect the general market average. Manufacturers generally seem to feel that a war in Europe will not affect the local market at all. One or two companies that have sold extensively in eastern Europe, Poland and Germany and Czechoslovakia, are raising the question as to what is going to happen to the orders they already have, but seem to feel that the problem is one whether they can get the equipment through, rather than a fear of cancellation or Government insistence upon non-compliance with the orders. The general feeling, however, is that the only change, if any, in the present situation will effect the terms of sales on export business; that is, sales will be made only upon a cash basis.

Factories are now operating at about 75 per cent of capacity, with a number of plants operating overtime. Except for the one day holiday, this week, no extensive shutdowns have been anticipated.

Cleveland Builders Report Inquiries Numerous

CLEVELAND—Activity during the last 10 days of August enabled some dealers here to pull up even with, or slightly ahead of, July from the standpoint of orders. Purchases of single machines rather than large scale projects apparently were responsible. September started off with inquiries numerous.

August Business Held Up Well With July

CHICAGO—Machine tool orders during August compared favorably with and in some cases exceeded the July totals. Small tool sales increased about 35 per cent over the previous month. Nothing outstanding as to machines ordered developed during the month, the going business consisting largely of small miscellaneous machine tools. Barring the possibility of business being disturbed by war overseas, local machinery sellers see nothing but optimism ahead for the fall months. It is the opinion here that business has so largely discounted a general European war that immediate bad effects may not be experienced.

August A Fair Month But Future Is Doubtful

NEW YORK—Most dealers did a fair to good volume of business in August, generally better than the July volume. The immediate effect of a declaration of war in Europe is expected to cause some hesitation in local ordering until the effect upon domestic economy is clarified. Amendment of the present neutrality act would obviously have a large effect upon machine tool business, both as regards munition and aircraft manufacture. Foreign business is thrown into a state of uncertainty until the shipping situation is clarified. Up until Saturday, however, Amtorg Trading Corp. was proceeding with the purchase of equipment on which negotiations had started in the recent past.

Flame Control Used On J. & L. Converters

PITTSBURGH — With Bessemer Flame Control equipment now being installed on the two converters at its Pittsburgh Works, the Jones & Laughlin Steel Corp. here will soon have all of its five converters operating under this new scientific control method which features the use of an arrangement of photo-electric cells as a part of the control system.

The continued use of this Jones & Laughlin invention, on which patent applications have been filed, is further proving its earlier success in controlling the Bessemer process to a degree of uniformity never before attained, according to the company.

With growing experience in the use of the Bessemer Flame Control, it is said, Jones & Laughlin operators are reaching a new and higher skill in maintaining uniform temperatures and uniformly reproducible quality from heat to heat. Records of heats blown are showing narrowed range of temperature of the steel at the end of the blow, improvement in freedom from surface defects, sounder structure in the center of billets and bars, and higher degree of workability in machining, forming and fabricating, it is claimed. The steel produced for screw stock under Bessemer Flame Control methods is showing gratifying results in uniform machinability, cutting speeds, feeds and appearance of the finished product.

In addition to the Flame Control method already developed and in use, other factors affecting the quality of Bessemer steel have been recognized and methods of controlling them are being rapidly perfected for further improvement in the product, the company states.

Lewis Finds New Deal Is Brutal, Callous to Labor

JOHN L. LEWIS, once a leading contributor to the New Deal campaign fund, this week scored the New Deal for its "callous" and "brutal" attitude toward labor, and criticized the administration's "thoughtless and sadly executed experimentation.

In his radio address on Labor Day, the CIO leader likewise chided the Roosevelt administration for giving too much attention to the European War. Lewis said:

"In the face of the economic debacle in America many of our statesmen are more concerned and agitated over the political quarrels in Europe." He said that "the national debt has already reached such proportions that it may never be liquidated by orthodox methods."

Plastics for Stampings—Erratum

IN the article that appeared on page 49 of the Aug. 17 issue under the above title, the plastic case illustrated at the left is for the latest Miami sales register, but the register shown at the right does not bear the Miami label. Made by the same manufacturer, Krauth & Benninghofen, it has a drawn aluminum case and was presented as an example of metal fabrication of a similar product.

It was also stated in the body of the text that the author (Herbert Chase) had designed the plastic case in collaboration with Harry J. Waechter. Mr. Waechter was responsible for the mechanical design, but it was Russell Katz of Krauth & Benninghofen who designed the Miami portable plastic case itself.

HEX MARKS are painted on the sides of the barns by the Pennsylvania Dutch of Lebanon County to *halt weg basen segen* (keep away evil spirits).

CIRCLE L is the identifying mark on every casting made at the Lebanon Steel Foundry to assure the user of its structural soundness and integrity.

THERE'S adventure waiting for you, Sailor Lad, off there across the Seven Seas. Guantanamo, Hankow or Singapore—wherever the swift greyhounds of the Navy carry the Stars and Stripes you, and 50,000 others like you, will be there, too, keeping the watch behind the guns.

But if wind and tide desert you, Sailor Lad—if angry seas claw your free-board and crash across your decks—keep a stout heart. Navy ships are built to scoff at wind and weather. That's why the Navy engineers use Circle L Alloy Steels in Diesels, turbines, pumps, valves and fittings. The searching fingers of wear and corrosion will never slow your engines when the signal flashes "*FULL AHEAD*".

Wise manufacturers in scores of industries, too, keep production "*FULL AHEAD*" with the help of Lebanon Circle L Alloy Steel Castings in their equipment. Talk to a Lebanon engineer. He'll help select the right alloy for your particular service conditions.

LEBANON STEEL FOUNDRY · LEBANON, PA.
AMERICAN LICENSEE, GEORGE FISCHER (SWISS) METHOD

Lebanon STAINLESS AND SPECIAL ALLOY Steel Castings

California Builds Steel Homes

(CONCLUDED FROM PAGE 47)

recently been completed in metropolitan San Francisco and Los Angeles.

In original cost the Soulé steel home, which requires close to three-fourths of a ton of steel per room, averages approximately 8 to 10 per cent higher than the same design frame house, depending on the locality. This differential is more than compensated for, however, by lower maintenance costs.

One of the unusual construction features of these houses is the low labor cost, due to the speed with which they are framed. For the small or medium sized dwelling, the average time for framing is one or two days, using a crew of only three or four men.

While foundations are being laid, frames are prefabricated in the factory and then cut up into sections of 8 to 10 ft., a size which can be conveniently carried by truck and can be handled and put into place by three men without the use of a gin pole. Trusses are cold rolled from angle iron and fabricated at the factory.

Floor joists are of steel, either open-web type or junior I-beam. For the single-story dwelling of four to eight rooms, 7-in. junior I-beams or 12-in. open-web joists are used. This type of support gives absolute rigidity, doing away with the possibility of squeeking or sagging.

For wall studding No. 16 gage, 4-in. pressed studs are used on 16-in. centers. These patented studs are pressed in the factory from strip and are of the channel type with the edges closed in, designed for maximum rigidity and strength for the displacement of metal.

To avoid any cumulative error in framing by sections, the fabrication is done complete in the shop and then cut into sections which are carefully numbered by metal tags for reassembly. The studs and cross tiers are all arc welded as well as bolted. One-half in. rod is used for lateral bracing and ¾ in. channel steel is used for cross bracing. Steel frame windows in multiples of the stud spacing of 16 in. are welded directly to the studs.

Studs are placed in double rows to give two walls with a four-in. dead air space between. A strip of angle iron, welded to the bottoms of the studs for both walls, are held down by plates fastened by an anchor bolt.

One of the advantages of this type of stud is due to the open-web design, which cuts down the cost of wiring and rough plumbing by allowing the conduit and piping to run through the studs.

In this house other materials may be substituted for stucco in the exterior wall construction.

Two kinds of studs are used in different types of Soulé houses, the all-steel stud and the wood-nailer stud. The wood-nailer stud, which differs little from the all-steel stud except that a chemically treated wood strip, 1½ x 1½, is attached to each steel stud, is used principally when wood rustic siding is desired. With a stucco finish, the metal lath or stucco netting is wired directly to the steel framework. Metal siding is screwed to the metal studs by means of factory drilled screw holes.

The popularity of these new steel houses indicates that California is headed toward more durable home construction. The absence of warpage and wood shrinkage, cracking, termite attack and the fire hazard in the steel house has already resulted in many changes in the frame dwelling, which is striving to meet the challenge.

The general impression is that if steel houses gain a foothold in Western United States, some 2000 miles from Eastern steel centers, they should find ready acceptance in other sections of the country.

TRADE NOTES

Ransome Concrete Machinery Co., general office and main plant, Dunellen, N. J., has just appointed W. S. Hiler & Co., 427 W. San Antonio St., El Paso, Texas, as its representative in western Texas, New Mexico, Arizona, and the country of Mexico on its welding tables and positioners.

Odell Tool & Die Co. has moved from 4670 Algonquin Avenue, Detroit, to 8820 Grinnell Street.

L. S. Starrett Co., Athol, Mass., reports net profits of $330,244 for the fiscal year ended June 30, last, equal to $2.13 per share on the outstanding common stock, which compares with net profits of $465,283, or $3.05 a share for the previous year.

Atlantic Brass & Copper Co., dealer in brass, copper, aluminum, steel and stainless steel strips, tubing and sheets, recently opened warehouses at 73 Warren Street and 132 Lafayette Street, New York. H. M. Schwartz heads company.

Allis-Chalmers Mfg. Co. has moved its district office at Chattanooga, Tenn., to the Chattanooga Bank Building, 737 Market Street. D. S. Kerr is manager.

Harnischfeger Corp., Milwaukee, has submitted a low bid of $293,200 for 25 electric bridge cranes for U. S. Navy Yard. The company recently received an order for the same type cranes from the navy several weeks ago, valued at $350,000.

Bucyrus-Erie Co. has moved its southern district office to Atlanta. This office, formerly located in Birmingham, serves a district including North Carolina, South Carolina, Tennessee, Georgia, Florida, Alabama, Mississippi, Arkansas and Louisiana.

The Metal Goods Corp., St. Louis, has been appointed by the Globe Stainless Tube Co., Milwaukee, as a distributer of stainless steel tubing.

Detroit Ball Bearing Co. of Ohio has become successor to the Ohio Ball Bearing Co. of Toledo. This firm, which specializes in anti-friction bearings and devices for industrial applications, will continue to operate in the 16 counties of the northwestern part of Ohio. The Toledo company will be managed by G. E. Binkelman who formerly was with the Timken Roller Bearing Co.

Scrap Men Pledge War Board Support

CLEVELAND—Directors of the Institute of Scrap Iron and Steel, Inc., holding a two-day midyear meeting here Aug. 28 and 29, pledged the institute to support the War Resources Board set up by the Army and Navy. Through the institute's War Service committee of seven members and its 19 chapters, it was pointed out the scrap industry has both central and regional machinery for helping meet any emergency.

The bundling division discussed possibilities of safeguarding and promoting the market for No. 2 hydraulic compressed bundles through identification of individual dealers' bundles, bonding of press operators and certifying the product. Possibilities of undertaking research to develop markets for galvanized material, scrap tin plate and terne plate were also studied.

Ohio dealers held a session to discuss Ohio taxation problems and to present a united front on their claim that scrap yards are processers and thus subject to a State year-end inventory tax on the basis of 50 per cent, instead of the present merchant classification in which their inventories are held at 70 per cent value.

Directors adopted a standard set of by-laws and chapter procedure, and re-elected E. C. Barringer executive-secretary.

CRANE PRESENTS:
The "UTILITY TWINS"
STARRING THE NEW, NOS. 422 and 423
200-POUND, BRASS GATE VALVES

TWO new star performers join valvedom to serve you —the Nos. 422 and 423 Crane Brass, Solid Wedge, Gate Valves.

We call these valves the "Utility Twins" and that's what they are—ideal for all-around, hard service on 200-pound steam, water, oil, or gas lines. The No. 423 is made with renewable seats and disc of Crane Nickel Alloy—a metal that's matched to the needs of really tough jobs of flow control. The 422 has integral seats and a Nickel Alloy Disc. Both valves, proved in laboratory and field tests, are worthy of any piping system.

There's added utility in the twin-like design of the 422 and 423. Interchangeability of operating parts will show a saving in the need of spares. Advanced features that facilitate dismantling and re-assembly assure widest general usefulness. Both valves have slip-on disc connection.

But most important to you is that the 422 and 423 are Crane-Quality—all the way through. Just like all Crane valves, they are products of sound design . . . expert engineering . . . able craftsmanship—backed by elaborate research and manufacturing experience of over 84 years. To you, Crane-Quality in valves gives strongest assurance of dependable flow control at minimum cost.

GET COMPLETE INFORMATION IN BULLETIN 311

It will pay you to look into these new Crane valves. Bulletin No. 311 gives you all the interesting facts, sizes, prices. Ask your Crane Representative for a copy or mail the coupon below. Keep this folder handy—with your Crane No. 52 Catalog showing more than 38,000 valves, fittings, and piping items for every need.

CRANE

CRANE CO., GENERAL OFFICES: 836 S. MICHIGAN AVE., CHICAGO

VALVES • FITTINGS • PIPE • PLUMBING • HEATING • PUMPS

IA-9-7-39

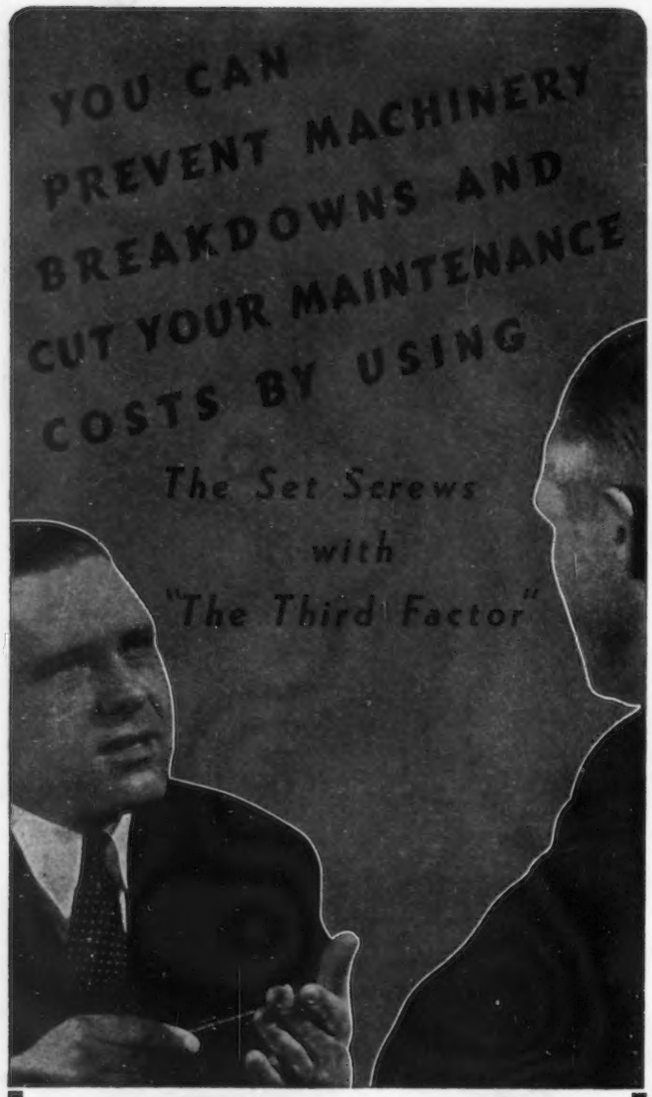
CRANE CO., 836 So. Michigan Ave., Chicago, Ill.
Gentlemen: I want a copy of Bulletin No. 311 on the new Crane 200-pound brass gate valves. No obligation, of course.

Name.....

Address.....

City.....*State*.....

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS



UNBRAKO

SELF-LOCKING
HOLLOW SET SCREWS
WITH THE KNURLED POINTS

Fig. 1641
Pat. App. For

are 1. STRONG 2. ACCURATE and 3. WON'T SHAKE LOOSE.

When you use these screws, you're insuring against a heap of trouble. Gone is the need to continually check-up on set-screws . . . you just know they're tight all the time, and as they do stay that way no trouble can follow. The clever knurling on the points locks them in place, once they're set up in the usual way. Removal is easily made with the ordinary hex bar wrench when adjustments are needed and the screws reused any number of times. Write now for samples and literature.

Fig. 1645
Pat. App. For

STANDARD PRESSED STEEL Co.

BRANCHES
BOSTON
DETROIT
INDIANAPOLIS

JENKINTOWN, PENNA.
BOX 523

BRANCHES
CHICAGO
ST. LOUIS
SAN FRANCISCO

JUST BETWEEN US TWO

Double Fault

The blink test item of Aug. 24 had two mistakes. Phil (G-E) Sowersby writes that Dr. Luckiesh pronounces his name with the accent on the first syllable—loo'keesh—not on the ultima, as we reported.

And A. W. Miller writes:

> *"You make a very conservative statement when you say, 'You should not permit your favorite family journal to lie prone while you read it.' I will go further and say you* cannot, *unless you use a glass table and a set of mirrors. Prone means flat on the face, like the way you have just fallen down."*

Sorry. We notice that William Faulkner makes the same mistake in "Sanctuary." Like us, he interprets a little too liberally Webster's definition, "lying flat or extended, especially with the face downward."

Haymaker for Mrs. Grundy

The promotion material publications issue in praise of themselves is rarely inspired. We will resist the temptation to spring the one about the shoemaker's children, hoping that it will be allowed to rest for awhile, being weak from overwork, as is Mark Twain's remark about the weather. And while we are off the subject, we pray, too, that the phrase "geared to . . . ." will be confined to descriptions of mechanisms.

As we were saying, stodginess characterizes most songs of praise issued by publishers, which is why you could have knocked us down with a hairline rule to see the *Ladies' Home Journal* courageously kick the proprieties due west of the midriff by heading a recent full page newspaper ad, *"Vive la Difference!"*

Our Cross

Our own particular promotion problem is to find a way of conveying quickly a conception of the great field THE IRON AGE serves. *"The industries manufacturing metal products"* is exact but colorless. So we supplement it with alliterative extremes—*"our readers make everything from hair pins to harrows, mouse traps to motor cars, locks to locomotives, typewriters to trench diggers, crankshafts to caskets, baby carriages to bulldozers,"* and so on.

We have just learned that in Dayton, O., there is an Umbiliklamp Co. If the product is metal and if the company will listen to reason, it will be nice to be able to add *"umbilical clamps to umbrella ribs."*

Gonfalon Under Wraps

The Oberleutnant never did have much use for our slogan, *"The World's Greatest Industrial Paper,"* regarding it as a little on the flamboyant side. But, as he is always ready to listen to reason, the chances are we would still be waving it if it were not for the suspicion that slogans are one of the things that never did recover from the depression.

However, they may be coming back, for we notice that *Printers' Ink* prints an extra large crop of new ones, of which our favorites are:

Keeps A Head (Lucky Lager Beer)
Freshest Thing in Town (Creamer's Bakery)
They Moo for More (Cottonseed Meal for cows)

Puzzles

Last week's farmer's fence was 1.58114 rods long.

J. M. Elliott, of Johannesburg, S.A., who prizes "This Week on the Assembly Line" for the advance information it gives him on the new cars coming out, sends this in:

Substitute figures for the x's in this example in division:

```
XXX)XXXXXXXX(XX8XX
    XXX
    ---
     XXXX
     XXX
     ---
      XXXX
      XXXX
      ----
      0000
```

Par, he says, is less than 15 minutes.

—A.H.D.